## The Metalworking Weekly

A PENTON PUBLICATION

#### Selling Ideas to Bosses

STEEL presents knowhow brought out in brainstorming session with ten managers . . . Page 71

#### Missile Arsenal Builds Up

It represents \$13 billion in sales potential to industry from now through 1960 . . . . . . . . . . . Page 61

#### **Deburring with Sound**

Try it when other methods are difficult or expensive. Cost savings can be enormous . . Page 102

#### Plastic Laminates Ride Uptrend

Easy to form, they offer style and color . . . Page 104

#### Part Stocks Level Out

The decline in component inventories has stopped, but a rise isn't yet in sight, either . . . Page 137

CONTENTS - PAGE 5

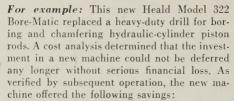
#### it's mainly a matter of TIMING!

#### WHEN to replace a machine can mean the difference between profit and loss

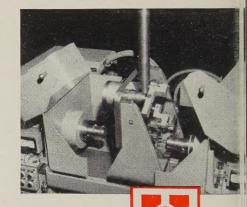
Too EARLY is just as bad as too late. But somewhere in between there's a mathematically determinable right time to retire that old machine and replace it with a new one. A time when this replacement works out to your best advantage from the standpoint of production cost and capital investment.

Guess-work, intuition or rule-of-thumb computations usually come up with the wrong answer. And even carefully conceived "obsolesence formulas" may have their pitfalls. Because incorrect replacement timing, one way or the other, can waste thousands of dollars, this problem is of vital concern to all industry.

But Heald can help you solve it. Our sales engineers are well experienced in precise methods of replacement analysis. If you're in doubt, or would like to check your own computations, call in your Heald engineer. He will be glad to help you determine the right time to replace And if now is too soon, he will tell you so. Similar cost studies by Heald engineers have pointed the way to many substantial savings.



Old Machine	New Machin
11	24
3,080 hrs.	1,380 hrs.
9,480 hrs.	3,240 hrs.
\$356	\$100
\$27,800	\$15,000
e	\$12,800
	39.6%
	11 3,080 hrs. 9,480 hrs. \$356



YOU pay for obsolesence. Replacement pays for itself!

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago Cleveland Dayton New York





Distributors stock a large variety of Bethlehem products, and their delivery service is fast and dependable.

#### "Local distributors of steel are vital to our set-up"



Bernard Anderson, Treasurer, Marcus Transformer Co., Inc., Rahway, N. J.

Marcus Transformer Co., Inc., is a name well known to users of electrical equipment. As one means of coordinating production schedules and avoiding manufacturing delays, this Rahway, N. L. firm buys much of its steel from near-by distributors.

this Rahway, N. J., firm buys much of its steel from near-by distributors.

"Today," says Bernard Anderson, Treasurer, "customers demand something more than quality alone. We find that we have to be geared for speedy production and early delivery dates—and that's why local distributors of steel are vital to our set-up. Without such distributors and their big stocks and many services, we couldn't operate under our present arrangement.

"We purchase all our angles, channels, plates, and hot- and cold-rolled sheets from distributors, who furnish them cut the way we specify. This enables us to avoid big capital outlay for inventory and shear equipment. It also saves us the space that a large inventory always requires. And when we're pressed for time, we can usually get overnight service from the distributors we call.

"Another point: to a certain extent, every job we do is a custom job. Hence our month-to-month needs cannot be wholly anticipated. It's a great help to be able to order by phone, if necessary, and know that the steel will be at our door when we want it."

HERE'S WHAT THE DISTRIBUTOR OFFERS YOU. Bethlehem sheets, bars, shapes, plates, tool steel, and other steel products are stocked by distributors equipped to serve you well. Not only can the distributor be your "storage space," but he shoulders the "cost of possession"—items such as insurance, handling costs, etc. Because of his specialized machinery, he can do many things you need—like cutting, sawing, slitting. And he's always able to make delivery fast!

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. Bethlehem Pacific Coast Steel Corporation, San Francisco

Call the distributor - your Shopping Center for Steel



It's an ingenious unit that automatically shuts off if the system fails — or the tank is emptied. Then too, it provides a device that bleeds air after each refill . . . and a precise mechanism that equalizes pressure to assure a uniform drink. Sanitary and corrosion-proof, all its working parts are made of stainless steels — not just one steel, but four.

The plunger and stop are Type 430F bar (magnetic)... the spring is 302 wire (non-magnetic) . . . the probe is 303 bar (machinability) . . . and the cylinder is 304 welded tube (economy). Despite this mixed requirement, all 4 grades are supplied overnight by Frasse.

You'll find it simpler, when working with stainless steels, to work from Frasse warehouse stocks. The wide range of sizes, shapes and analyses, so quickly available from this single source, is a time and effort saving convenience. For stainless steels . . . always call Frasse first.





& Co., Inc.

P. O. Box 1267

for

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Bars

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Sheets

**Plates** 

Strip

STAINLESS

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**Fittings** 

Valves

HARTFORD 1, CONN. P. O. Box 1949 JAckson 9-6861

BUFFALO 7, N. Y. P. O. Box K, Sta. B PHILADELPHIA 29, PA. 3911 Wissahickon Ave. BAldwin 9-9900 BEdford 4700

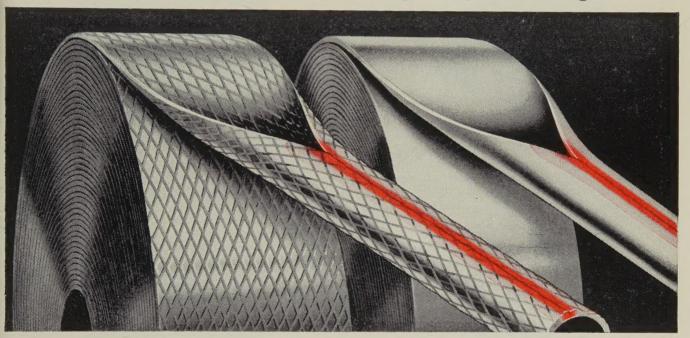
SYRACUSE 1, N.Y. HOward 3-8655

NEW YORK 13, N.Y. 17 Grand St. WAlker 5-2200

> LYNDHURST, N. J. ROCHESTER, N.Y.



with TOCCO\* High-Frequency Heating



Quaker State Metals Company, leading fabricator of aluminum building products, recently installed a 25 kw, 450,000 cycle TOCCOtron vacuum tube oscillator for continuous welding of aluminum tubing. Both plain and patterned strip, anodized or untreated according to end-use requirements, is continuously welded. Diameters vary from ½" to 1" O. D. and wall thicknesses from .024 to .064".

The weld is absolutely uniform throughout the entire length, assuring a dependable, strong bond. The whole operation is so smooth and quiet, you hardly know it's running.

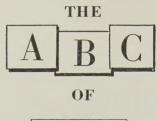
Aside from the perfect weld, for the ultimate in product quality, TOCCO Induction Welding, being a completely automatic process, saves time and money over many conventional joining methods.

Remember, whether your products are of ferrous

or non-ferrous metals, TOCCO can almost certainly save *you* time and money in heat-treating, brazing, welding, or hot forming operations.



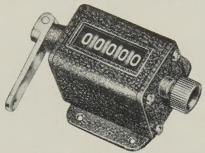
# Mail Coupon Today—NEW FREE Bulletin The Ohio Crankshaft Co. • Dept. S-4, Cleveland 5, Ohio Please send copy of "Typical Results of TOCCO Induction Heating". Name\_\_\_\_\_\_ Position\_\_\_\_\_ Company\_\_\_\_ Address\_\_\_\_\_ City\_\_\_\_\_Zone\_\_\_\_State\_\_\_\_\_





### Why is COUNTROL important in every business today?

Countless times a day, every business needs to know "how many? . . . how much? . . . how far? . . ." and many other questions that can be answered only by facts-in-figures. But how to get these figures . . . from so many different machines, processes, operations and systems? Veeder-Root Counters are doing it every day, by means of:



#### MECHANICAL COUNTING

Small Resets count strokes, turns, or pieces . . . are used by thousands for moderate duty in parts inspection, quality control, conveyors, machine tools, light presses, etc.



#### HAND COUNTING

Where objects or units cannot be counted electrically or mechanically, hand-operated counters like this Hand Tally do the job. For instance, quick spot checks of production or performance, traffic count, inventory, etc. Fits palm of hand, counts one for each pressure of thumb lever, resets to zero by turning knob.

Insist on Standard

#### **VEEDER-ROOT** COUNTERS

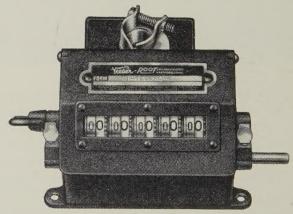
from your Industrial Supply Distributor





#### ELECTRICAL COUNTING

These remote-indicating counters bring your production machines as close as your office wall. AC or DC, they can be connected in series with any simple switch, and will transmit production figures instantly over any distance. May be panel-mounted in groups.



#### CONTROLLING

Set it for the exact number of turns, pieces, or operations required . . . and this Predetermining Counter will control the run exactly . . . preventing over-runs and shortages. When the predetermined number is reached, counter will light a light, ring a bell, or actuate a stop-motion.

IN SUM: If it can be counted or controlled . . . count on Veeder-Root to do it. Get in touch with your Industrial Supply Distributor for standard counters for application to your production machines and processes. And get in touch with Veeder-Root for counters to be built into original equipment. Veeder-Root Inc., Hartford 2, Connecticut.

#### This Week in



**OUTLOOK** ..... 101

**OUTLOOK** ..... 135

EDITORIAL	59
Unemployment is still rising, don't be misled by the bare statis They need explanation.	

#### SPECIAL FEATURE ..... 71



How To Sell Ideas to Bosses—Top management must clear channels of communication so that ideas can flow freely from originators in the lower echelons.

#### WINDOWS OF WASHINGTON 68

Concentration in missiles? Makers expect accusation shortly, get set to defend industry.

#### MIRRORS OF MOTORDOM ... 75

Detroit hears Edsel must produce in 90 days or lose its sales and dealer organization to Ford or Mercury.

#### THE BUSINESS TREND ..... 79

Purchasing agents confirm belief that business downtrend is near bottom. As orders firm, so does employment.

#### WHERE TO FIND -

Behind the Scenes	6
Letters to the Editors	10
Editorial & Business Staffs	16
Calendar of Meetings	23
Men of Industry	83
Machine Topics	
New Products	
New Literature	133
Advertising Index	165

Business	— OUTLOOK	

V	Missile Arsenal Builds Up—\$13 Billion Market through '60	6
	Should You Buy Research?—It's an aid in launching product	62
	Bluecollars Go White—IBM puts plant employees on salary	6
	German Exports Dip—Decline may continue through summer	6
	Printed Circuits Level Off—Market reportedly saturated	60
	Minneapolis-Moline Wage Increase Deferred—Union agrees	6
	Republic Steel Unveils Fast Order Processing System	6
V	How To Sell Ideas to Bosses—Here are clues to a solution	7
	Convair Builds Wind Tunnel—It uses 1150 tons of steel	8

#### Production -

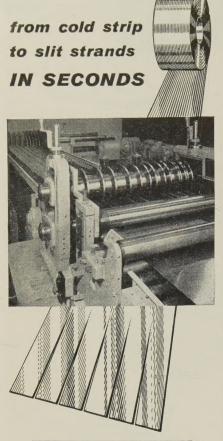
<b>√</b>	Deburring with Ultrasound—It aids in precision partmaking 10
	Plastic-Coated Metals Ride Uptrend—Number of uses grows 10
	Unit Saves Cleaning Time—Plant more than doubles output 10
	Hollow Plate Speeds Heat Exchange—Designed for heavy duty 10
<b>√</b>	All-AC Drive Answers NeedProvides adjustable speeds 1
	Progress in Steelmaking—J&L Uses Simplified Gage Control $1$
	Submerged Arcwelding Gets Boost—New unit is light, fast 1
	Magnets Cut Conveyor Costs—GE uses them on paint line 12
	Mill Handles Big Plane Parts—Design latitude broadened 1
	Submerged Arcwelding Gets Boost—New unit is light, fast  Magnets Cut Conveyor Costs—GE uses them on paint line

#### Markets-

V	Inventory Reduction Grinds to Halt—Limited buying ahead	137
	Steel Imports by Country of Origin in 1957	143
	Scrap Price Index Still Slipping	156

Nonferrous Metals—Aluminum Price Cut to 24 Cents . . . . . . . . 160

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, \$10 a year; all other countries, \$20 a year; single copies, 50 cents. Metalworking Yearbook issue, \$2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bidg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.



#### YODER ROTARY MULTIPLE SLITTERS

A Yoder slitter converts mill-width coils of flat-rolled metal into many variable-width strands in amazingly short time. Speed, coupled with great accuracy and low manpower requirements, makes a Yoder slitter an important factor in keeping production and overhead costs down.

Operated by only two men, the Yoder Type 3-48 slitter illustrated is designed to accommodate standard mill-width coils up to 48 inches wide, in a variety of metals and thicknesses. The slit strand widths can be held to within a .004" tolerance.

Even if your steel requirements are as little as 100 tons a month, the savings to be realized in time, manpower and raw material costs alone will pay for a Yoder slitter in the first few months of operation.

There is a Yoder slitter designed and engineered to meet your requirements, and to speed the delivery of "special" width stock in a wide range of large or small sizes. Send for your free copy of the fully-illustrated, 76-page booklet, "Multiple Rotary Slitting Lines."

THE YODER COMPANY
5502 Walworth Avenue • Cleveland 2, Ohio



#### behind the scenes



#### **High Level Brainstorming**

When you get to Page 71 you'll find an interesting report of a Brainstorming Session that was staged Mar. 18 at Cleveland's Union Club. Sponsored by STEEL, it was calculated to reveal methods by which secondary management could sell ideas to top brass. When in the course of human events it becomes necessary for an employee to approach the top dog in his organization with an idea to improve production or reduce costs, he simply can't barge in and shout: "Hey, Mac, get the lead out and open your eyes! You're running this outfit into the ground, know what I mean? Now here's a sharp idea I got that'll save you from the mess you're making. . .'

Editor Walt Campbell was much concerned about the obstacles, real and psychological, that loom between an employee with an idea and a management that won't listen. "In the current Cost Crisis," Mr. Campbell remarked, "we can't afford to overlook any access to the problem. Maybe we ought to assemble some middle and top management people and try to find through brainstorming how they may be best approached."

#### Search for Quarters

The Penton Building contains some nicely appointed offices and adequate conference rooms, but Editor Campbell preferred more formidable surroundings for the distinguished guests he aimed to invite. In a word, he wanted to go whole hog, so he presented himself to George O. Hays, president of the Penton Publishing Co., publisher of STEEL, and outlined his brainstorming scheme. "Our guests will be eminent persons," he explained. "I wonder where we can meet?"

"I have it!" exclaimed Mr. Hays brightly. "We can meet at the Union Club! You can all be my guests."

"The Union Club!" Walt echoed. "Splendid!"

It really was splendid, too, because the Union Club is more than just an impressive building full of oil paintings, and rich carpeting, and leather chairs, and private parlors and soft-footed attendants: It is one of the most respectable and distinguished clubs in the U. S., and was founded 86 years ago as a "club where companionable and cultured gentlemen could meet in greater quiet to discuss topics of the day."

Well, the companionable and cultured gentlemen Campbell rounded up to take advantage of Mr. Hays's invitation were industrial hot shots, but according to Associate Managing Editor John Morgan, they didn't meet in "greater quiet." "They

started at the opening bell," said John, "and they didn't relax for a second. You see, our machine tool editor, Bob Huber, and I were primed to throw in suggestions in the event that the flow of ideas slowed to a trickle, but we never had a chance. That group was really terrific."

#### **Industrial News Beat**

Two news releases crossed our desk this week—or was it last week? Fundamentally an old cod fisherman, we are scarcely geared to cope with the startling and fantastic industrial news that floods our coop in the form of publicity. We doubt if members of the public relations fraternity would turn handsprings on receipt of intelligence revealing that their squibs had been published in this column, so it's probably safe to consider two samples of their work.

Up in Racine, Wis., the Webster Electric Co. recently perfected a Stereo Ceramic cartridge, and if you don't know what a Stereo Ceramic cartridge is, that's your fault. Anyway, it is a small lightweight deal, has a diamond point, replaceable stylus, and is a plug-in type that fits any standard record player or changer. The line that intrigued us was this: "The company anticipates a booming market for these cartridges."

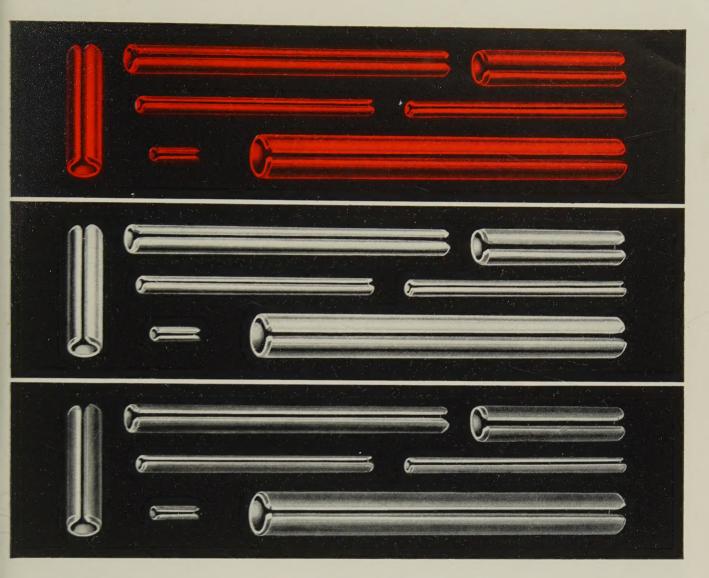
The second item was short, but fraught with something or other. It's silly to suggest to our intelligent readers that "fraught" used to be spelled "vracht," and that it comes to us from Middle Dutch, but we'd like to make a motion that both spellings be abandoned. The item that is vracht-or fraught-with something concerns the Chemical Machinery Div. of Baker Perkins Inc., Saginaw, Mich., for many years a prime supplier of chemical processing equipment. It reports that it is now tooled up for full scale production of special equipment for mixing solid rocket and missile fuels. Think of a civilization that can calmy view the activities of an industrial organization that produces pots and paddles for mixing stuff that could literally shoot you to the moon!

#### **Fragile Fractions**

If the denominator of a certain fraction is 5 more than the numerator, and if 3 is added to both terms of the fraction, the resulting fraction will equal ½. What, pray tell, was the original certain fraction?

Shrdlu

(Metalworking Outlook—Page 53)



#### What are your Rollpin<sup>®</sup> requirements...

Corrosion-resistant steel, beryllium copper, or carbon steel? An "available" fastener with better than 90% of the catalogued size and length combinations obtainable from stock? A fastener with consistent dimensional quality control and fully dependable strength and vibration performance? A fastener that costs less than most of the pin type fasteners it replaces . . . and cuts assembly costs too?

Slotted, chamfered, cylindrical Rollpin spring-pins meet these requirements and many others. Available Rollpin inventory stands at tens of millions of pieces. Rollpin performance is consistently high because uniform shear strength, dimensions and hardness are guaranteed by high ESNA quality control standards. Investigate installed Rollpin costs as compared to grooved-type pins, taper pins, precision dowels and many types of rivets.

Standard Rollpins are made from carbon steel and Type 420 corrosion-resistant steel in stock sizes from .062" diameter to .500". Cadmium, zinc or phosphate finishes may be specified. They're also available in beryllium copper for applications requiring exceptional resistance to corrosion, and anti-magnetic and non-sparking properties—in diameters from .062" to .250".

Why not simplify and speed up your orders by sending for data on all the Rollpin sizes and materials today? Elastic Stop Nut Corporation of America, Dept. R46-460, 2330 Vauxhall Road, Union, New Jersey.



ELASTIC STOP NUT



CORPORATION OF AMERICA

# Studs for VELVELD process machined from Youngstown cold finished bars

Progressive fabricators rely on the Nelweld method for fast, dependable end-welding of studs to steel surfaces. This novel electric arc process—utilizing flux-filled steel studs—substantially reduces direct fastening costs when used to replace conventional time-consuming methods such as drilling, tapping, hard welding, through-bolting or the securing of straps and rivets.

To maintain their world-wide reputation for product quality and uniformity. Nelson Stud

To maintain their world-wide reputation for product quality and uniformity, Nelson Stud Welding, a division of Gregory Industries, Inc., uses Youngstown Cold Finished Bars as the basic material for stud production.

Youngstown Cold Finished Bars provide high machinability and greater uniformity of composition, structure and surface finish to help you increase production of more uniform parts. Always specify Youngstown—it's your best assurance of quality.

Why not call or write your nearest Youngstown District Sales Office today for additional information or metallurgical assistance?

Close-up of studs being bored to accommodate their charge of flux (top collet) and then cutoff (center collet). Two finished Nelweld studs, shown in the pan in foreground, were machined simultaneously in the 6-position machine. First operation—feed out and face; second—bore; and third—cutoff.





THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

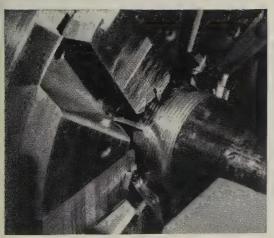


Cold finished bars



For precision cutting...

## TRANSPARENT SUNICUT OILS ASSURE YOU GOOD VISIBILITY, PEAK PRODUCTION



Transparent Sunicut oils assure excellent finish in critical operations at close tolerances. Good visibility speeds production.

Transparent Sunicut® oils, including heavy-duty and dual-purpose oils, are available in many grades to suit your specific needs. They give outstanding results...especially where precision cutting is required.

Their transparency takes the "blinders" from work that needs close watching, permitting close product control, faster production, lower unit cost. Machine operators like Sunicut's "cleanliness." Most important, transparent Sunicut oils assure you of good finishes.

For full information about Sunicut cutting oils, call your Sun representative, or write to Sun Oil Company, Philadelphia 3, Pa., Dept. S-4.

INDUSTRIAL PRODUCTS DEPARTMENT

#### SUN OIL COMPANY

Philadelphia 3, Pa.

In Canada: Sun Oil Company Limited, Toronto and Montreal

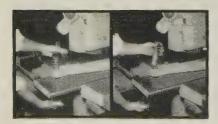




Short run? Complicated pattern? If it's sheet metal up to  $\frac{1}{4}$ " mild steel, if it's punching, notching or nibbling, it's profitable on a Strippit Fabricator!

Set up in minutes! Punches and dies are changed in 30 seconds or less, and Strippit guided punches need no aligning or adjusting. Back stop with precision gauge is instantly set by a locking knob. Self-tripping finger stops on gauge bars provide multiple stopping as the work is moved rapidly under the punch. A switch gives you single punching or 165-stroke-a-minute nibbling, and all tools are within quick reach in attached "file drawers" or shelves. The Fabricator is more than a one-machine shop—it's a whole system of quick-change, high-profit fabrication used by thousands of shops.

What's more, you can add the Strippit Positive Duplicator for high-speed punching in medium runs — plus the Dupl-O-Scope to punch Duplicator templates right from the drawing, in a few minutes. Write today for details and demonstration at your plant by the Strippit mobile unit. Warehouse stocks in Chicago and Los Angeles.



fool Holder is pulled out, for instant removal of die and punch assembly, ready for the next interchangeable tool. 1½" diameter capacity holder shown, 3½" diameter holder also available.

#### WALES STRIPPIT COMPANY

210 Buell Road, Akron, New York

In Canada: Strippit Tool & Machine Limited, Brampton, Ontario

## LETTERS

#### Cost Crisis Series: Valuable

I think your Cost Crisis series of stories is performing a needed and valuable function in the industry. Incidentally, two good-sized companies requested quotations on our equipment described in your article, "Automatic Welder Saves 66 Per Cent" (Feb. 24, Page 72).

Eugene D. White

Field Sales Manager Lewis Welding & Engineering Corp. Bedford, Ohio

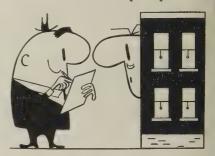
#### **Data Helpful to Supervisors**

Your Program for Management article. "Production Control for Profits" (Mar. 17. Page 83), contains a great deal of information needed by our reorganized production control group. It should be extremely helpful to our newly assigned supervisory people.

H. S. Wright

Supervisor, Scheduling & Order Release Summers Gyroscope Co. Santa Monica, Calif.

#### **Houston Steel Scrap Report**



It is gratifying to see that you include Houston in your weekly iron and steel scrap prices report. This, of course, makes your magazine even more desirable.

Robert H. Lang

Lufkin Foundry & Machine Co. Lufkin, Tex.

#### Disagrees with Ruttenberg

Referring to your article, "Union Methods Are Outdated" (Feb. 17, Page 78), there is no doubt that union methods are outdated. Harold Ruttenberg's solution, however desirable, is not realistic except for specific industries at specific times.

Productivity, except in good times, is not necessarily desired in many industries. One of these would be the auto industry. Most auto manufacturers are reducing their production and, in turn, their manpower. In most cases, the plants affected know the approximate level of manpower required to produce a required number of units. Company budgets are based on the standards used to arrive at these levels.

Mr. Ruttenberg's proposal would suggest that either: 1. The standards are too high and fewer men should be able to do the job, with a monetary increase because of their greater productivity. 2. Or the

(Please turn to Page 12)





#### \*Play it cool and don't press

You can polish Stainless Steel to a mirror finish but you can't rush the job. Too coarse a grit, too much speed, too much pressure might scorch or discolor Stainless because steels of this family are not rapid heat conductors.

Use light pressure on the polishing agent, and remember that you can't get a desired finish any faster just because you press harder. Take your time. This

is by way of saying that Stainless Steel isn't difficult to fabricate, it's just different.

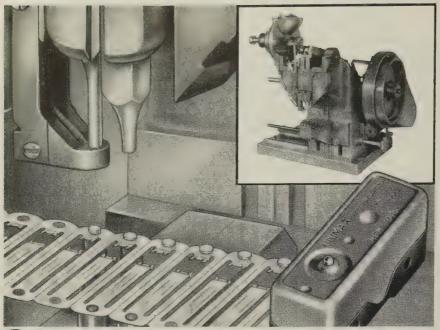
All your work on Stainless will be expert if you follow the "Stainless Steel Fabrication Book." If you don't have a copy, we'll be glad to send you one. Write on your company letterhead to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Warehouse Distributors
United States Steel Export Company



#### IMINATE PUNCH-PRESS—SAVE 50% LETTERS



#### **Tubular's DOUBLE-DRIVE RIVETER** HELPS UNIMAX\* ON SWITCH ASSEMBLY

#### 50% Saved is 50% Earned

At Unimax, the problem of holding close tolerances in high-speed assembly of precision switches was solved by Tubular Rivet & Stud engineers. Previously, the silver contact was set on one machine and "coined" t on a punch-press. Because there can be no distortion of the spring element, and overall tolerances of the coined contact must be held to  $\pm$  .001 inches, assembly was slow, and **Tubular** was brought into the picture.

The ingenious application of a Tubular 104-T double-drive machine eliminated the punch-press operation and made a 50% saving in time and assembly cost.

The double-drive machine performs as follows: The machine head with the hopper attached automatically feeds a contact into the jaws, guides it through the spring element and sets it on a spring pin anvil. During the next and subsequent cycles this operation is repeated. At the same time, the adjacent head is completing the operation on the set contact, coining it on the anvil at high speed while holding the specified tolerances.

#### \* Unimax of Wallingford

Unimax Switch Division of The W. L. Maxson Corporation is located at Wallingford, Connecticut. Unimax precision snap-acting switches find wide use in modern control systems. Their current-handling ability and compactness simplify construction of complex electric controls and their availability in varied actuator styles gives the designer wide choice of operating means.

#### **TUBULAR of Quincy**

You may not be assembling switches but if your problem can be solved with riveting equipment, Tubular can do it. Call our nearest office or send us your blue print for complete information and technical help.

† "Coining" is the process of embossing designs, patterns or ridges on metal by completely trapping the blank between dies and applying pressure. (Coining definition from "The New American Machinists" Handbook 1955)

SEE US AT BOOTH NO. 1717 • ASTE SHOW ubular Rivet & STUD COMPANY QUINCY 70, MASS.

FASTEN AUTOMATICALLY BETTER and FASTER with TUBULAR'S RIVETS and MACHINES

MIDWEST OFFICE & WAREHOUSE - CHICAGO

BRANCH OFFICES: ATLANTA . BUFFALO . CHARLOTTE . DALLAS . DETROIT INDIANAPOLIS . LOS ANGELES . NEW YORK CITY . PHILADELPHIA . ST. LOUIS · SEATTLE ·

See your local classified directory for phone numbers

(Concluded from Page 10)

budgeted manpower figure is correct, and the additional higher wages would put the firm over budget, dollarwise.

The second alternative is obviously detrimental to the firm, while the first would not be a true assumption. This leaves us without a true measure for productivity.

A more realistic method of awarding higher wages is to base it on profits, not productivity. Walter Reuther's proposal of profit sharing with employees, though going beyond attainable limits as stated, would be one solution. However, the "bonuses" should be figured on individual plant bases rather than companywide. This would create incentives at each location to reduce cost.

Fred B. Bialek

Mfg. Standards Engineer Los Angeles Assembly Plant Mercury Div., Ford Motor Co. Rivera, Calif.

#### Reading in Reception Room

While waiting in the reception room of the Bethlehem Steel Co., Bethlehem, Pa., this morning, I read with interest your article, "Direct Reduction Is Closer" (Mar. 17, Page 102). We would appreciate a reprint.

P. H. Shober

Assistant General Sales Manager General Coal Co. Philadelphia

#### Wrong Tense Used

Grammatically speaking, tense makes a big difference in a statement. For example, look at the item about Carl Stugard in your Men of Industry Department (Mar. 17 issue, Page 68). After noting his election as a vice president, you say: "He was manager, special machine tool division." As a matter of record, Mr. Stugard is both a vice president and the manager of the special machine tool division.

Henry Dods

Technical & Service Publications Dept. Cincinnati Milling Machine Co. Cincinnati

#### What's Nuclear Power Cost?

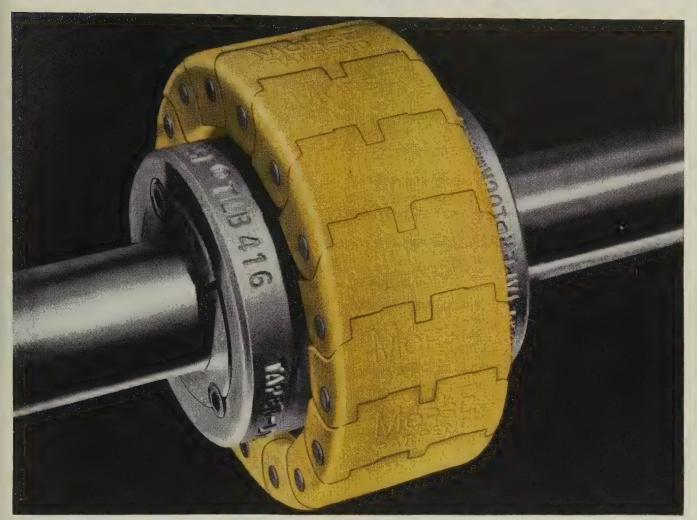
Cost per kilowatt of electricity from nuclear reactors is not covered in your article, "Russia Lags in Atom Race" (Jan. 13, Page 46). As an Engineers' Club, we are interested because the Rural Cooperative Electrical Association of Elk River, Minn., is going to install a reactor, starting sometime the last part of 1958. Do you have any information on cost?

Clarence Livgard

President Federal Cartridge Corp. Engineers' Club Anoka, Minn.

• Westinghouse Electric Corp. estimates that the cost per kilowatt hour is 6.4 cents at its Shippingport, Pa., atomic power station. The world's first large scale nuclear electric plant devoted exclusively to peaceful uses, it first produced electricity on Dec. 18, 1957.

#### Now...from Morse Chain



## New Nylon Couplings

#### Cost 20% less, need no lubrication, last indefinitely!

New Morse Nylon Flexible Couplings cost less to buy and maintain than steel couplings. They use economical, stock roller chain sprockets—need no protective cover. They last longer, too . . . operate without lubrication because friction and wear are negligible.

Order complete couplings—½" pitch links plus stock sprockets (plain, finished bore, or taper-lock)—or buy just the links and use your own sprockets. Morse Nylon Couplings, made of Du Pont "Zytel" resin, are

ideal for loads from fractional to 40 h.p. and speeds from 500 to 5000 rpm. And they adjust to misalignment.

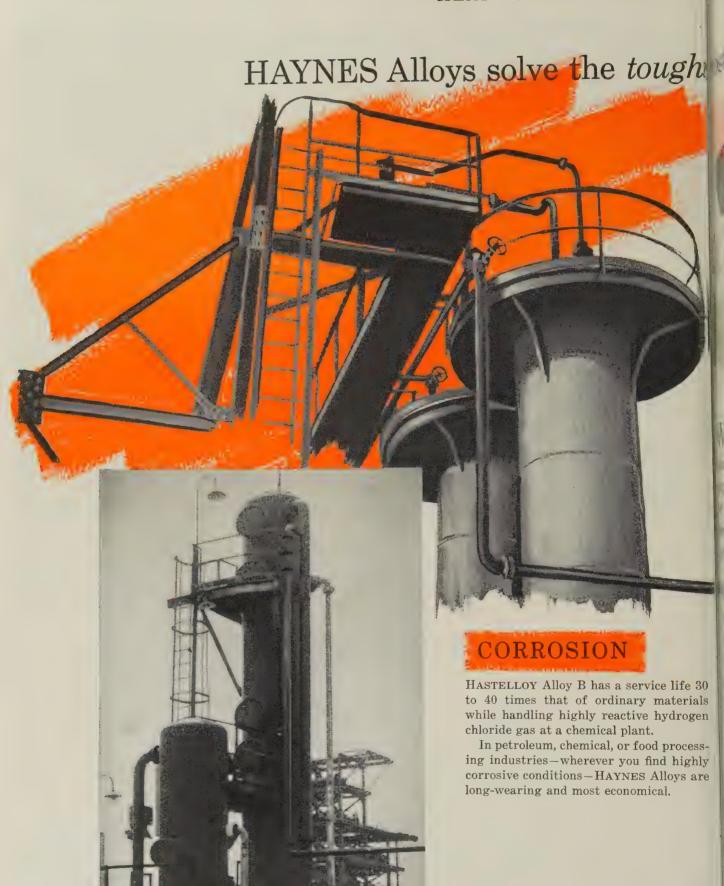
For facts on Nylon Couplings, or the other couplings in the most complete line ever offered, call your local Morse Distributor. He's listed in the Yellow Pages under "Power Transmission". Or write: MORSE CHAIN COMPANY, DEPT. 2-48, ITHACA, NEW YORK. Export Sales: Borg-Warner International, Chicago 3, Illinois.

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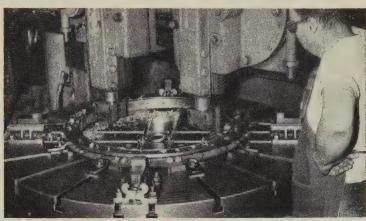
April 7, 1958





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#### MACHINING

HAYNES STELLITE 98M2 alloy tools remove metal fast in machining jet engine diaphragm rings. These tools take a  $\frac{1}{2}$ -in. cut and remove 55 cubic in. of metal in 15 minutes. About six rings now are machined per grind where other tools failed to finish even one. And tool service life has jumped over 600 per cent. Fast, precision machining with long tool life makes a big difference in production costs.



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Continuous Tooth

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#### with the Backbone

Proven On-the-Job Advantages of This Type of Gear Reduction

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- 2 Stronger teeth, due to archlike construction.
- 3 Greater load carrying capacity.
- 4 More silent and smoother gear action.
- 5 Uniform load across face due to balanced thrusts of opposing helices.
- 6 Better lubrication, due to wedge action of teeth.
- **7** Overall design makes it less costly to produce.
- 8 Can be substituted for straight tooth gears.





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#### Hand Pusher Batch Type Furnace For small production lots and experi-

mental sintering. An all-purpose unit for operation from 1300° F. to 2500° F. Made in various sizes for sintering from 25 to 300 pounds per hour.

#### Mesh Belt **Continuous Type Furnace**

Sintering furnace for small light parts in copper, bronze, brass or steel. Temperature range from 1300°F. to 2100°F. Provides low temperature silver brazing, bright annealing, as well as sintering of powder metals. Production ranges up to 500 pounds per hour.

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> For sintering furnaces, just as in all types of industrial heating equipment, you can depend on Lindberg's ability to supply exactly the right equipment for your needs. Just get in touch with your nearest Lindberg Field Representative, or write Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois. Los Angeles Plant: 11937 South Regentview Avenue, at Downey, California.







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See Lindberg in Booth No. 12, Metal Powder Show in Philadelphia

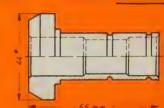
LINDBERG heat for industry

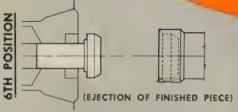


## All'round the work

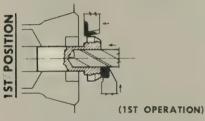
#### HOW ACME-GRIDLEY BASIC DESIGN SAVES TIME IN GERMANY

Automotive sleeve produced in West Germany on a German-built  $\acute{o}$  Spindle Acme-Gridley Automatic. Machining is performed in 27.3 seconds, a saving of 30.8% of the time used by previous methods.

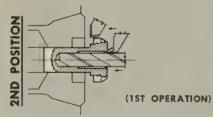




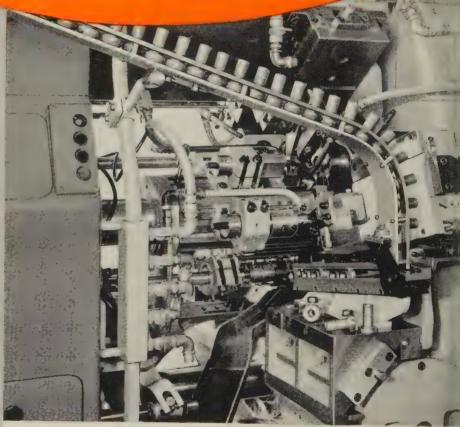
MAGAZINE LOAD (1ST OPERATION)



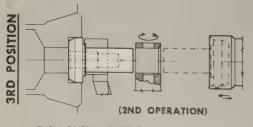
ROUGH TURN HEAD FACE DRILL LARGE HOLE



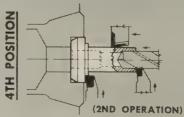
FINISH TURN HEAD
CHAMFER INNER DIAMETER
DRILL SMALL HOLE



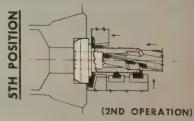
RUCKANSICHT MIT MAGAZIN EINRICHTUNG
REAR VIEW WITH MAGAZINE LOADING ATTACHMENT



TURN OVER AND RELOAD



TURN SHANK DIAMETER PARTWAY
FACE BACK OF HEAD
FACE END OF SHANK • DRILL



TURN SHANK DIAMETER REMAINDER
• FINISH FORM COLLAR BACK OF
HEAD AND GROOVES • FINISH DRILL

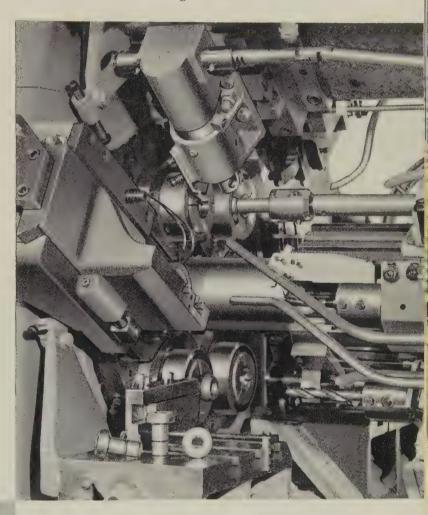
#### ... where there's work to be done and time to be saved ...

## there's an Acme-Gridley to do it!

In the metal working plants of Essen and Hamburg you'll often hear the phrase Schnellste Automatiche Fertigung. Chances are, mit Acme-Gridleys, is added for Schnellste Automatiche Fertigung means high speed automatic production and all 'round the world the use of Acme-Gridley Automatics results in high speed production and greater precision in metal working.

The illustrations show the production of an automotive sleeve which is tooled from an upset forged blank fed into the German built Acme-Gridley by a magazine loading attachment. After one end of the part is machined it is turned endfor-end by a special attachment and then the other end machined—the part completely finished.

This high speed—high quality production is typical of the way Acme-Gridley circumferential automation makes things faster-better-cheaper-all 'round the world. That's why we say "When there's work to be done and time to be saved, there's an Acme-Gridley to do it".



WENDE FINRICHTUNG LAGE 3 TURNING ATTACHMENT POSITION 3

ry don't you

INDEX... to lower machining costs...

CIRCUMFERENTIAL AUTOMATION

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## Norton Pulpstones Prove...REPUBLIC COLD DRAWN BARS SHRUG OFF BRUTAL PUNISHMENT

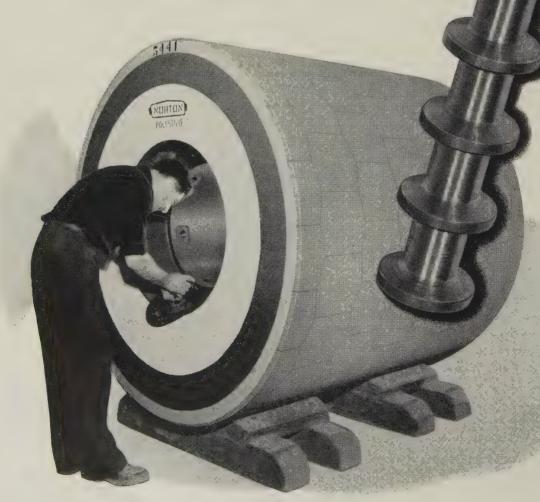
Chewing ton after ton of whole logs into pulp is all in a day's work for pulpstones manufactured by the Norton Company, Worcester, Massachusetts. Maximum reliability is a must in every component.

This is a major reason why Norton specifies Republic Cold Drawn Steel Bars for production of anchor studs to hold abrasive segments to concrete cylinder. Since cold drawn bars show marked physical improvement compared with the same analysis, hot rolled, they provide extra strength to absorb brutal in-service stress.

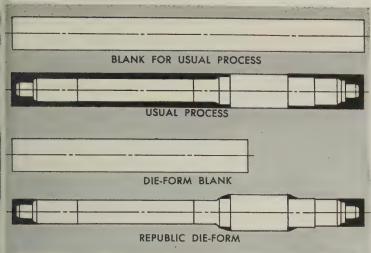
Beyond final product reliability, Republic Cold Drawn Steel Bars facilitate the severe forming combination of machining and roll-threading required in stud production. Finally, finished stud cost is far below the minimum made possible with former materials.

In addition to greater strength, hardness, and machinability which benefit the Norton Company, Republic Cold Finished Steel Bars provide both size and cross-sectional accuracy, smooth bright surface, absence of scale, and close tolerance straightness.

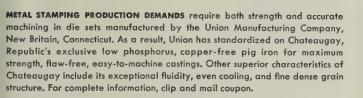
It will pay you to check these characteristics against your product and production requirements. For further information, contact your local Republic representative or mail coupon.

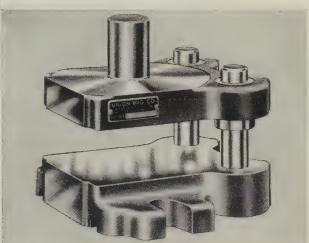


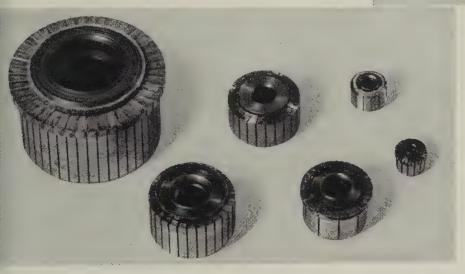
PULPSTONE STUDS require a rugged combination of roll-threading and machining during production. Finished stud is subject to brutal punishment as pulpstone reduces logs to wood pulp. Republic Cold Drawn Steel Bars meet all demands with flying colors.



INCREASED DEMANDS ON MANUFACTURING EFFICIENCY to meet shrinking profit margins require use of modern methods and materials. Republic Die Form is a good example of such progress. Die Form is a cold formed steel bar closely approximating the final multi-diameter part. Using a Die Form blank, you can make major savings in required machining and scrap loss. In the example shown above, 200 tons of Die Form blanks were used to produce parts formerly requiring 300 tons of conventional bar stock. Mail coupon for facts.







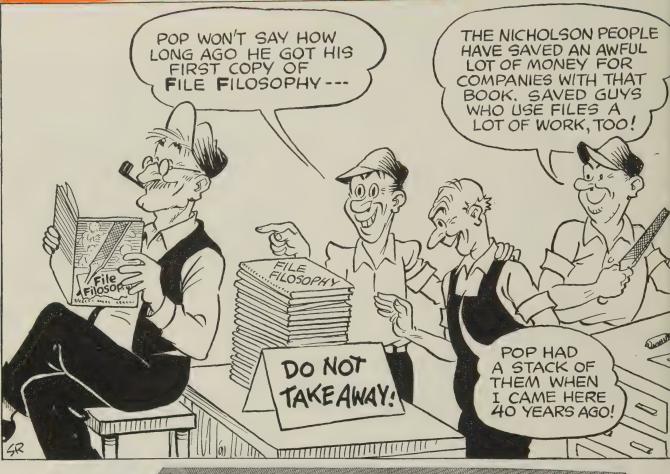
close Tolerance DEMANDS require that center holes in these electric motor commutators be virtually perfect to assure a proper press-fit on motor armatures. When ordinary steel was used for hubs, expensive pull broaches used to finish holes lasted for only 25,000 pieces. Several years ago, Han-Kor, Inc., Cleveland, Ohio, switched to Republic Cold Drawn Leaded Alloy Steel for hub manufacture. Since that time, no broaches have required replacement. Top machinability of Republic Cold Drawn Leaded Steels may help you save time and money. Send coupon for data.

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#### CALENDAR OF MEETINGS

Apr. 7-8, Wire Reinforcement Institute Inc.: Annual meeting, Boca Raton Hotel, Boca Raton, Fla. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

Apr. 8, Material Handling Institute Inc.: Spring membership and directors' meeting, Cleveland Hotel, Cleveland. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

Apr. 8-9, Industrial Truck Association: Spring meeting, Hotel Cleveland, Cleveland. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Apr. 8-10, Industrial Fasteners Institute:
Annual meeting, Boca Raton Hotel,
Boca Raton, Fla. Institute's address:
1517 Terminal Tower, Cleveland 13,
Ohio. Secretary: James J. Whitsett.

Apr. 8-11, Society of Automotive Engineers: Aeronautic meeting and production forum and aircraft engineering display, Hotel Commodore, New York. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Apr. 9-10, Malleable Founders' Society:
Market development conference, Edgewater Beach Hotel, Chicago. Society's address: 1800 Union Commerce Bldg.,
Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

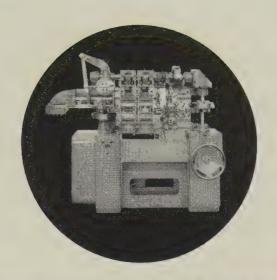
Apr. 13-16, American Chemical Society:
 Annual meeting, San Francisco. Society's address: 1155 16th St. N.W.,
 Washington 6, D. C. Executive secretary: Alden H. Emery.

Apr. 14-15, American Society of Mechanical Engineers and American Institute of Plant Engineers: First annual maintenance and plant engineering conference, Penn-Sheraton Hotel, Pittsburgh. Information: ASME, 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Apr. 14-15, American Zinc Institute Inc.: Annual meeting, Chase Park Plaza Hotel, St. Louis. Institute's address: 60 E. 42nd St., New York 17, N. Y. Executive vice president: J. L. Kimberley.

Apr. 14-16, American Management Association: Special west coast general management conference on small business, Ambassador Hotel, Los Angeles. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Apr. 14-16, American Institute of Mining, Metallurgical & Petroleum Engineers: Open hearth steel and blast furnace, coke oven, and raw materials conference, Statler Hotel, Cleveland. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.



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Upward of 50 percent savings in setup time, tooling costs and floor space!

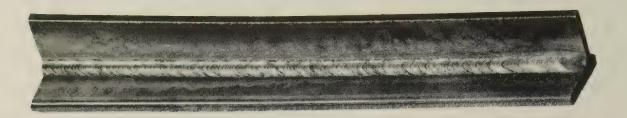
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## ALLEN-BRADLEY MOTOR CONTROL

Twenty-six machining operations are performed automatically on this huge transfer machine. To keep this machine operating continuously—to avoid costly production shutdowns—Baker Brothers, Inc., selected Allen-Bradley quality motor control—the simple control that is good for millions of trouble free operations.

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This Baker Automatic Transfer Machine is equipped with a special Allen-Bradley control panel, assembled from standard components listed in the latest A-B Handy Catalog.

Simplicity of design and silver alloy contacts are features of all Allen-Bradley control auxiliaries—they are similarly trouble free. Therefore, standardize on the Allen-Bradley line of quality motor starters, relays, push buttons, limit switches, and other accessories. You cannot possibly make a mistake!

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

#### BULLETIN 802T Oiltight Limit Switch

Has completely sealed operating head and switch body. This adjustable roller lever type saves installation time.

#### BULLETIN 700 Solenoid Relay

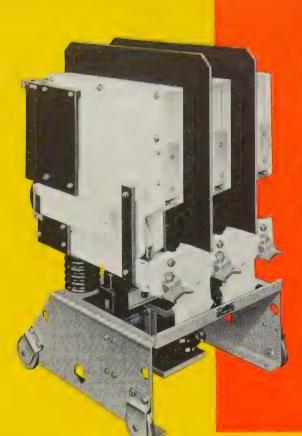
Universal type relay has contacts that can be connected for either "normally open" or "normally closed" operation.

#### Solenoid Starter

Popular across-the-line starter with accurate and reliable overload relays. 8 Sizes to 300 hp, 220 v; 600 hp, 440-550 v.







## Air break starters

for high voltage motors



Bulletin 966 high voltage air break, across-the-line synchronous motor starter in NEMA Type 1 enclosure.

This new air break contactor—around which Allen-Bradley has developed a complete line of high voltage starters—is designed to match your toughest applications. It features the same solenoid design—with only one moving part—that has made Allen-Bradley low voltage starters universally recognized for their tremendous operating life.

These new contactors are available in full voltage and reduced voltage starters—nonreversing or reversing—for squirrel cage, part winding, slip ring, and synchronous motors up to 1500 hp, 2300 volts; 2500 hp, 4600 volts. All starters are equipped with current limiting fuses and have an interrupting capacity of 150,000 kva at 2300 volts and 250,000 kva at 4600 volts.

It will pay you to investigate these quality starters. Complete information is contained in Publication 6080...please send for your copy, today.



Only One Moving Part. Simple solenoid design eliminates trouble-causing pins, pivots, and flexible jumpers.



**Double Break Contacts** of silver alloy never need maintenance. Vertical motion assures uniform contact pressures.



Easy Access from Front. Crossbar and contacts removable from front, without special tools, for easy inspection.



Faster Arc Suppression. New blowout design and novel arc chute. Chutes are molded from an arc resistant material.

Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd.
Galt, Ontario





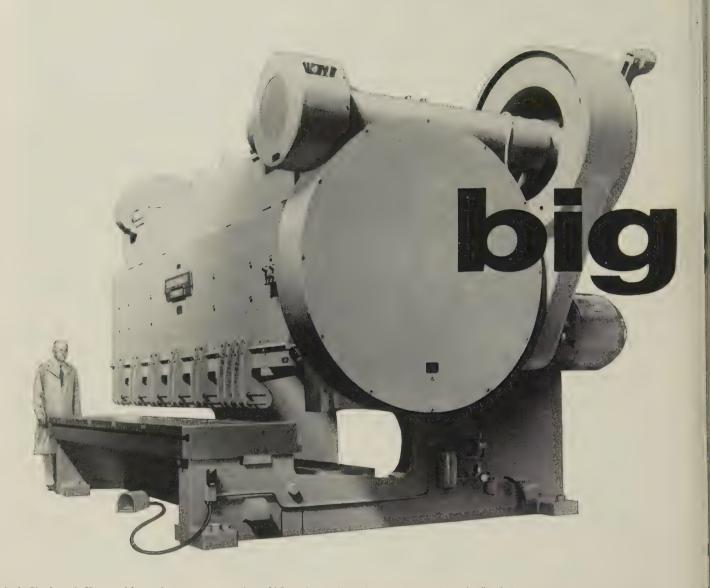
#### NOTHING TRANSMITS POWER WITH THE TENACITY OF ROEBLING

ROYAL BLUE WIRE ROPE. The other reasons why this wire rope gives long, dependable service are equally outstanding. It has exceptional flexibility, shock and abrasion resistance, and high strength beyond the realm of common wire rope usage. Collectively, these qualities give you a wire rope that is a superior value... Roebling Royal Blue. For details of the most widely accepted wire rope in Roebling's history, see your local distributor or write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.



DESIGN
FOR WIRE ROPE
Its ready adaptability is evident wherever power is transmitted. It conforms to unique design requirements. Use wire rope to transmit power.

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation



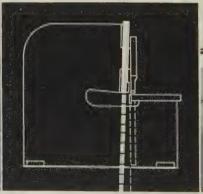
Typical Cincinnati Shears: big series 15012, capacity 1½", 12'; small series 1004, capacity 3/16", 4'; in between series 1810, capacity ¼",



steel, interlocked construction—welds used as load supports



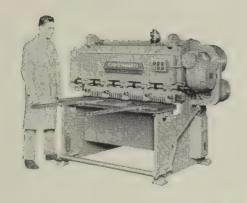
Hydraulic holddowns exert tons of pressure, insure accuracy



Non-float inclined ram maintains extremely accurate knife clearance

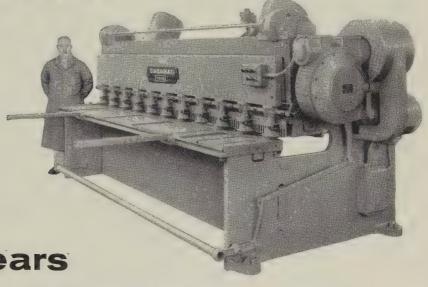


Front controlled power bacis standard, accurate, conve



## small

or in between



Cincinnati Shears
give you every advantage

Simple operation, micrometer accuracy, cost-cutting beed, all-steel construction, and versatility—these are advantages which make Cincinnati Shears earn eir way in your plant.

And, whether you're shearing steel or plastics, nonrrous metals or asbestos, wire mesh, clad metals, or ren radioactive material, the Cincinnati Shear line ves you a range of choices to fit your own requireents. Cincinnati Shears are in service cutting all of ese materials.

Cincinnati ruggedness enables you to use one knife

clearance for all thicknesses up to machine capacity.

Power operated back gages which are standard equipment, reduce non-productive time. Hydraulic holddowns provide tons of pressure, insure accuracy. The inclined ram permits the economy of four-edge knives, keeps work from binding between back gage and lower knife.

Since gap frames are standard, you can do notching, slitting or shearing work longer than the machine on any Cincinnati Shear to the limit of its gap.

Be sure to get the full Cincinnati story before you buy your next shear. Write Dept. C for Catalog S-7R.

Shapers / Shears / Press Brakes

ТН

THE CINCINNATI
SHAPER ...













#### INGALLS: Structural Steel Fabricators



INGALLS
IRON WORKS
COMPANY
Executive Offices
BIRMINGHAM, ALABAMA

Modern building design requires that structural members combine great strength and rigidity with ease of erection—at low cost. More and more designers and engineers are specifying fabricated structural steel to meet these important requirements.

Ingalls is a specialist in fabricating structural steel. With facilities to meet every modern requirement for fabricated structural steel, long experience, and a proven record of service, Ingalls stands ready to serve you.

If your company is planning a building which must combine strength, beauty and economy, Ingalls can serve you. Your inquiry is invited.

#### INGALLS INDUSTRIES ARE:

The Ingalls Iron Works Company, Sales Offices: New York, Pittsburgh, Chicago, Houston, New Orleans, Atlanta • The Ingalls Steel Construction Company, Sales Offices: New York, Chicago, New Orleans, Pittsburgh, Houston, Atlanta • Birmingham Tank Company, Sales Offices: New York, Pittsburgh, Chicago, Atlanta, New Orleans, Pascagoula
The Ingalls Shipbuilding Corporation, Shipyards: Pascagoula, Mississippi; Decatur, Alabama Sales Offices: New York, Chicago, Washington, Houston, New Orleans, Atlanta

#### TOOLING UP TO GIVE NEW AUTOMOBILES THEIR SPARKLE



## Designed for high speed high quality finishing

Production at top speed must be coupled with top quality finishing to satisfy the engineers at leading automobile plants. This takes cooperation among paint chemists, automotive engineers and DESPATCH engineers to develop finishing systems of the type shown here—built by DESPATCH for the nation's leading automobile manufacturers.

Are you launching a new product? Do you wish to "pep up" appearance of an existing product? Let DESPATCH'S experience in evaluating, recommending and creating completely engineered finishing systems help solve your particular problem. Write today for Bulletin 51K, 16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.



#### DESPATCH OVENCOMPANY

619 S. E. Eighth Street

Minneapolis 14, Minn.

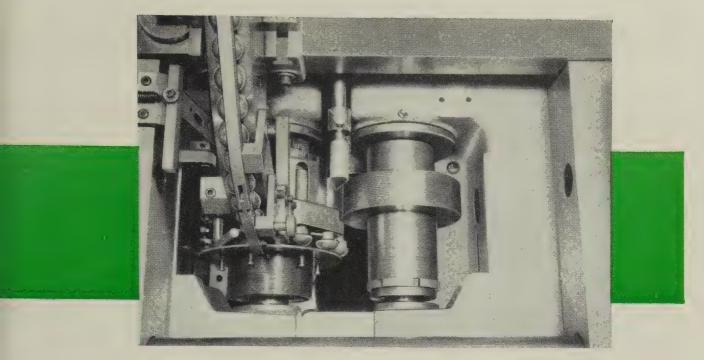
Sales and Service in All 26 Principal Cities

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

# AUTOMATED ROLLING

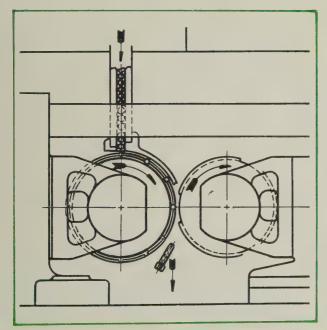
with the LANHYROL machine





The automatic features of the LANHYROL Thread Rolling Machine have enabled a large industrial fastener and related parts company to automate its process for producing button head oval neck track bolts. 34'' 10 pitch UNC threads are rolled 134'' in length to Class 2A fit.

One man now handles the entire operation, eliminating difficult and costly handling of hotforged bolt blanks required in the old process. Now . . . bolt blanks are cold-formed from



800-lb. coils of hot-rolled steel wire by passing through a wire-drawer into a two-blow header, conveyed to a hopper, threaded by Continuous Rolling on the LANHYROL Machine, and ejected as finished parts into a bin for removal.

Continuous Rolling (illustrated) is one of three thread-rolling methods utilized by the LAN-HYROL Machine. Blanks are delivered from a hopper to an automatic, indexing-type workrest. This indexes the pieces according to a preset cycle into and away from the rolling position. There, thread-rolling is accomplished by two opposed cam-type rolling dies.

Although the LANHYROL is capable of rolling 80 track bolts per minute, in this application it is only operated to slightly exceed the production rate of the header which is 60 blanks per minute. Thread finish is considerably improved over previous methods and roll life is excellent . . . more than 3/4 of a million bolts have been threaded to date with the original roll dies.

The LANHYROL Machine produces excellent threads at unequalled rates of output, and its method of operation fits well into automated processes. For information on its unusual range and flexibility, and the Infeed and Thrufeed thread rolling methods, send specifications and ask for Bulletin E-60.

4930

## LANDIS Machine COMPANY WAYNESBORO - PENNSYLVANIA - U. S. R.

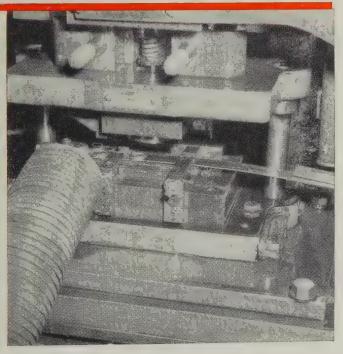
# How Frantz Manufacturing Co. improves with these (USS) products: Amerstrip,



**Springs with stamina.** These long-lasting American Quality Springs will go into garage doors and other Frantz building specialties. American Quality Springs are available in all sizes, shapes, and descriptions. They are inspected through every stage of the manufacture and meet the highest standards of quality.

# roller skates and garage doors Amerled, and American Quality Springs





Amerstrip is used in the manufacture of almost every part of the 15 types of Hustler Corporation skates made by Frantz. These skates will stand up under the punishing wear children may give them—yet maintain their attractive finish. Amerstrip is tailored to each particular job... has the physical properties to assure a good performance and efficient manufacture.

Tough, durable American Quality Springs play a major part in the smooth operation of Frantz garage doors. These quality springs make garage doors lower in cost and easier to operate than doors using counterweights—and they have proven equally durable.

#### Amerled ups machining speed 17.4%

Frantz has been machining its own axles and bearing cones for roller skates and conveyor wheels. Recently they switched to Grade "A" free-machining USS Amerled. This easy-to-machine, lead-bearing steel meets all their requirements at lower cost as it permits them to increase machining speed from 320 to 375 S.F.M.—a 17.4% jump—with no loss in tool life . . . and less rejects.

American Steel & Wire produces a complete line of manufacturers wire products. Our large technical staff can tailor these items to fit your individual needs. Call our nearest Sales Office today. American Steel & Wire, General Offices, Rockefeller Building, Cleveland 13, Ohio.

**Precision.** In the top picture, wheels are being added to roller skates at Frantz's final assemble table. In the bottom picture, a Bliss Roll Feed Punch Press is stamping ball races from 1\%" .047 USS Amerstrip at the rate of 195 per minute. Frantz also makes heels, toes, and channels from Amerstrip.

USS, American, Amerstrip and Amerled are registered trademarks

American Steel & Wire Division of



## Guide to better pump selection

for

specify

boiler feed condensate return hot and cold liquids chemicals refrigerants, etc.

up to 200 gpm. pressures to 900 ft.

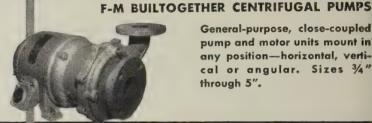


F-M WESTCO PERIPHERAL PUMPS

High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 11/4" through 21/2".

hot and cold liquids liquid circulation nonviscous liquids boiler feed cooling towers, etc.

up to 900 gpm. pressures to 525 ft.



General-purpose, close-coupled

pump and motor units mount in any position-horizontal, vertical or angular. Sizes ¾" through 5".

sewage slurries paper stock fruit shrimp vegetables, etc.

up to 30,000 gpm. pressures to 175 ft.

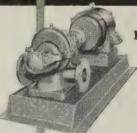


F-M NON-CLOG PUMPS

Unexcelled for clog-free handling of liquids with solids in suspension. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.

water supply plant service booster circulating air conditioning refrigeration chemical liquids boiler feeds, etc.

up to 50,000 gpm. pressures to 700 ft.

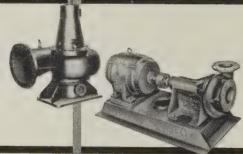


F-M SPLIT-CASE CENTRIFUGAL PUMPS

High, sustained efficiency over wide range of conditions. Lowcost maintenance. Sizes 11/2" through 36". Single stage or multistage.

hot and cold liquids chemicals circulating liquids nonviscous liquids cooling towers condenser circulation, etc.

up to 100,000 gpm. pressures to 250 ft.



F-M END-SUCTION PUMPS

A wide line of rugged, precisionbuilt pumps. Sizes 3/4" through 54". Horizontal or vertical centrifugal.

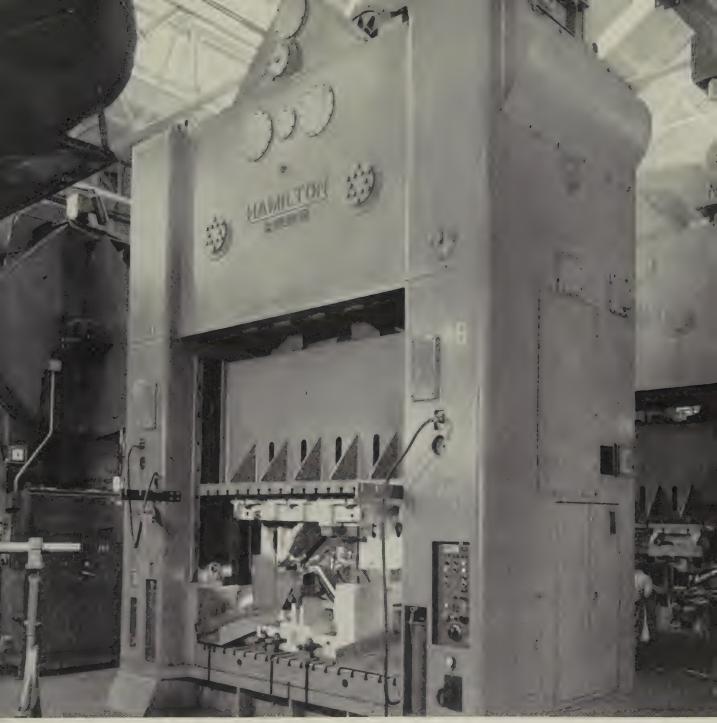
#### FOR LOW-COST PUMPING SPECIFY FAIRBANKS-MORSE

Need new pumps? Your Fairbanks-Morse Dealer has the world's greatest variety for you to choose from. Need help in selection? Your F-M Dealer and F-M Sales Engineer will help specify the right type, right size pump and driver for low-cost, foolproof operation. Call them today, or write Fairbanks, Morse & Co., Dept. S-4-7, 600 So. Michigan Ave., Chicago 5, Illinois.



**IRBANKS-MORSE** 

a name worth remembering when you want the BEST



This versatile 600-ton Hamilton Eccentric Gear Press is currently turning out a wide variety of parts in a major automobile plant in Detroit.

## Why an eccentric gear press?

Hamilton Eccentric Gear Presses are ideally suited for heavy duty operations—particularly deep draws and other stamping operations where the tonnage is encountered well up on the stroke.

The eccentric and gear are integral and rotate on

a short eccentric pin, as a result of which torsional and bending loads are negligible.

The many added features of Hamilton Eccentric Gear Presses guarantee greater production, improved stamping quality, and lower maintenance costs.

Write to Dept. 1C for Bulletin #13301, describing these machines

### Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools





Top row, left to right: piston pin, wheel nut, ball stud, pump shaft, faucet stem.

Middle row: spark plug body, eye bolt, shuttle tip, ball socket, universal joint bearing cup, splined square-head shaft.

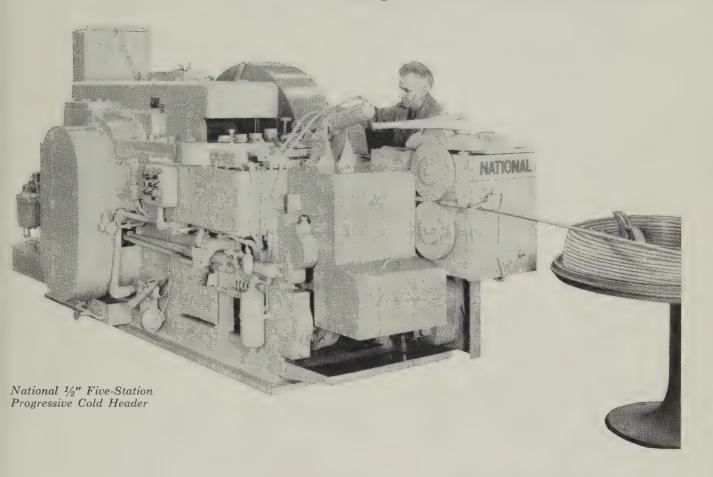
Bottom row: tube nut, tappet plunger, hollow rivet, blind rivet, distributor cap insert, commutator bar.

These are typical parts you can make to advantage, not by wasteful cutting, but by *cold heading* — flowing metal into accurate shapes. All of the above jobs, with one exception, were made complete from coiled wire to finished part, without intermediate annealing and coating, *in one compact machine!* Why are formerly difficult-to-head jobs like these not only possible now, but commercial? The answer is teamwork, on many fronts. For example:

(1) More versatile metals are now available in coiled wire. (2) Die materials and lubricants are still better. (3) We are getting important (to us) but usually insignificant concessions from cold-heading-minded parts designers.

(4) National Cold Headers, multiple-die Progressive Headers, Cold Formers

## The modern way to make Metal Parts faster, stronger, to amazingly close dimensions!



and Boltmakers, backed by our fast-growing engineering experience, are now specially equipped to produce reliably the formerly difficult jobs like these shown here.

Are your production problems like these? Perhaps cold heading could pay off for you in a remarkably short time. Let's find out.

Here is our service to metalworking, and you are under no obligation to buy. Send us samples or prints of your jobs. Better yet, bring them to Tiffin where more of our experienced people can participate in *your* problem.

We shall be happy to work with you in developing that better method.

Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

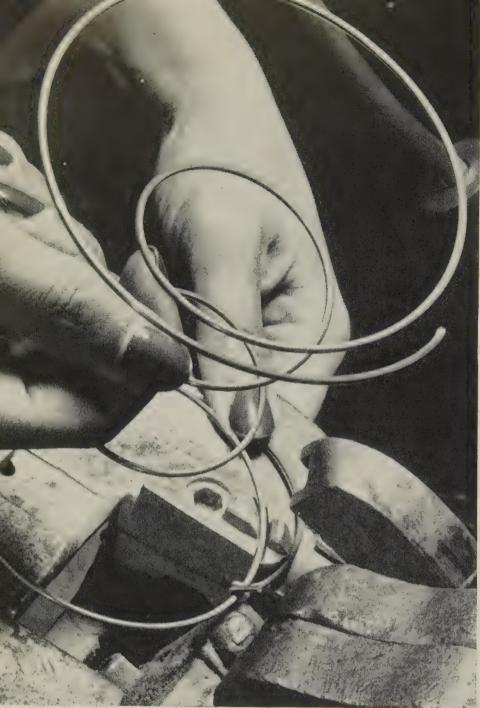
## NATIONAL MACHINERY CO.

TIFFIN, OHIO, U.S.A.

HARTFORD

DETROIT

CHICAGO



Tough test for Pittsburgh Steel's upholstery wire at Piedmont Spring Co. comes in coiling and knotting spring. Wire that is too hard will

break; wire too soft will lose springiness even after tempering. Uniform quality of Pittsburgh Steel wire insures uninterrupted production.

# Pittsburgh Steel wire adds years of life to upholstery springs

# Piedmont Spring Company calls Pittsburgh Steel upholstery wire "Best we've ever seen"

Pity the poor upholstery spring . .

It goes through the most torturous tresses and strains just getting made. Then, fully formed and ready for use all it can look forward to are years and years of supporting tons of jumping, running, standing, sitting or justilounging human weight.

If that upholstery spring is unappreciated, then consider how underer rated its wire can be. You have to be a veteran upholstery springmaker to know what it takes to make a first rate spring that can outlast the furniture it serves.

Such men are Bill and Bob Gastom of Piedmont Spring Company, Hickory, N.C. They choose only superior quality wire—like that supplied by Pittsburgh Steel Company. During their 31 years of combined springmaking experience, the Gastom brothers have seen just about every twist and turn there is to springmaking. Bill Gaston, who handless purchasing, sums up Pittsburgh Steel upholstery grade wire this way:

"Pittsburgh Steel wire is the best we've seen anywhere. And I'd tell that to anyone. It's exactly what a manufacturer needs in this business. We get uniform quality in every shipment."

Combination of quality Pittsburgh Steel high carbon upholstery wire and precision springmaking gives Piedmont upholstery springs enough liveliness and durability to serve several generations of furniture owners.

Liveliness—a must in an upholstery spring—can be seen when the finished spring is compressed. If it springs back to within one-quarter of an inch of its original length, say nine inches in a frame spring, then it has the quality to take years of hard use.

Upholstery wire from Pittsburgh Steel also must be able to withstand severe deformation during coiling and knotting.

Proper grain structure is another must. Too hard—the wire will break, scrapping an entire coil. Too soft—the wire will coil and knot easily—but it will be lifeless even after tempering. PlantSuperintendent Bob Gaston cites another all-important requirement:

"The wire we use must have uniform diameter—only .001 variation plus or minus allowed up to .075-inch and .002 variation for .076-inch and larger. If the wire didn't meet our close tolerances, it would seriously damage our coiling machines and stop production. And you know what that does to costs and lost orders. But there's no worry there with Pittsburgh Steel wire."

Piedmont Spring also uses Pittsburgh Steel's border and brace low carbon wire for edgewire frames that hold cushion springs. This wire must be able to withstand crimping and bending and have enough stiffness to support the finished unit. High carbon upholstery grade wire—.047 to .155-inch diameter—is transformed into cushion, back and frame springs. Lacing wire is used to join springs together in cushion and back frames.

Bill Gaston gives much of the credit for his company's enviable spring reputation and low production costs to wire from Pittsburgh Steel. He states flatly:

"We've never had a complaint from a customer because of the quality of the wire. It has never failed to meet our specs."

"And there's another thing I like about Pittsburgh Steel's performance," Bill adds. "That's the service. We keep a low inventory of wire. Many times we run to the bare minimum, but we always get our shipments on time to keep production going.

"When we want to talk to Pittsburgh Steel's district sales office, we get quick attention from the district manager himself right on down.

"Our aim at Piedmont is to make only the best upholstery springs —springs that will take years of hard use without failure. And we get them thanks to the most important ingredient in a spring quality wire like ours from Pittsburgh Steel."

These same benefits from Pittsburgh Steel's upholstery grade wire can be yours, too. And they don't stop with upholstery wire. Oil tempered wire, bright basic, core wire, ACSR wire, rope wire, high carbon MB spring wire or any other kind of manufacturers' wire are available to serve your needs.

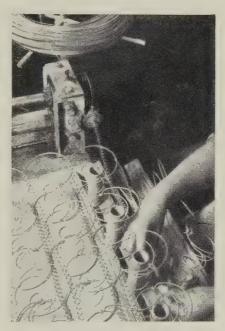
Trained Pittsburgh Steel engineers are close at hand to put their knowledge and experience to work in helping solve your problems.

Specify Pittsburgh Steel wire. Call the nearest district sales office listed at right. Do it today.



"Best wire we've ever seen" comments Bob and Bill Gaston (left and center) about high carbon upholstery grade wire from Pittsburgh Steel. The two owners of

Piedmont Spring Co. check the life in a Piedmont upholstery spring after tempering. After compression, spring must return to within onequarter of an inch of original length.



Cushion springs are joined together by lacing wire, forming the shape of a cushion frame for an upholstered chair. Piedmont springs made of Pittsburgh Steel wire take years of hard use.



Baling for shipping, Piedmont upholstery springs are compressed to save space. Bill Gaston says, "We've never had a complaint from a customer because of the quality of the wire."

## Pittsburgh Steel Company

**Grant Building** 

Pittsburgh 30, Pa.

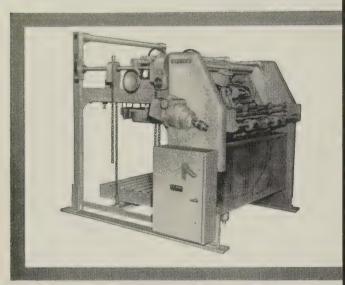


**District Sales Offices** 

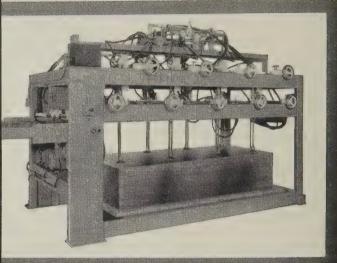
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#### NEED HELP WITH

## Sheet Handling Problems?



Dexter 9000# H.D. Feeder runs at speeds up to 9000 sheets of tin plate per hour. Used primarily in most major metal decorating plants.



Dexter Plate Feeder handles metal plates up to  $\frac{3}{16}$ " thick and a maximum size of 4-by-12 feet. Used in many plants for feeding descaling equipment.

### CHECK WITH DEXTER

Dexter's been designing and building sheet handling equipment for over 75 years...sheet feeders for metal decorating presses, scroll shears, punch presses, coaters, slitters...pack turnovers for speeding up two operation processes...oven strippers and pilers...cardboard and corrugated board feeders for presses and packaging lines ...paper feeders for printing presses, varnishers and folding machines. For almost any sheet feeding problem Dexter has the answer...with its wide range of equipment.

Dexter Feeders are available in over a hundred sizes, speeds and load capacities to suit individual machine or process requirements. Sheet sizes range from  $14 \times 14^{\prime\prime}$  to four by twelve feet...sheet thickness from .006" to  $\frac{3}{16}$ "

or more...load capacities from 6,000 to 30,000 pounds ...and speeds from 600 to 9000 per hour!

Thousands of Dexter sheet handling machines are in use today in container plants, electrical equipment factories, appliance manufacturing plants, in tin plating lines, printing and binding companies, and in a wide variety of other industries...speeding up production efficiently and economically.

If you need help with your sheet feeding problems—check with Dexter. Their combination of engineering experience and equipment flexibility may be the solution for increasing your productivity.

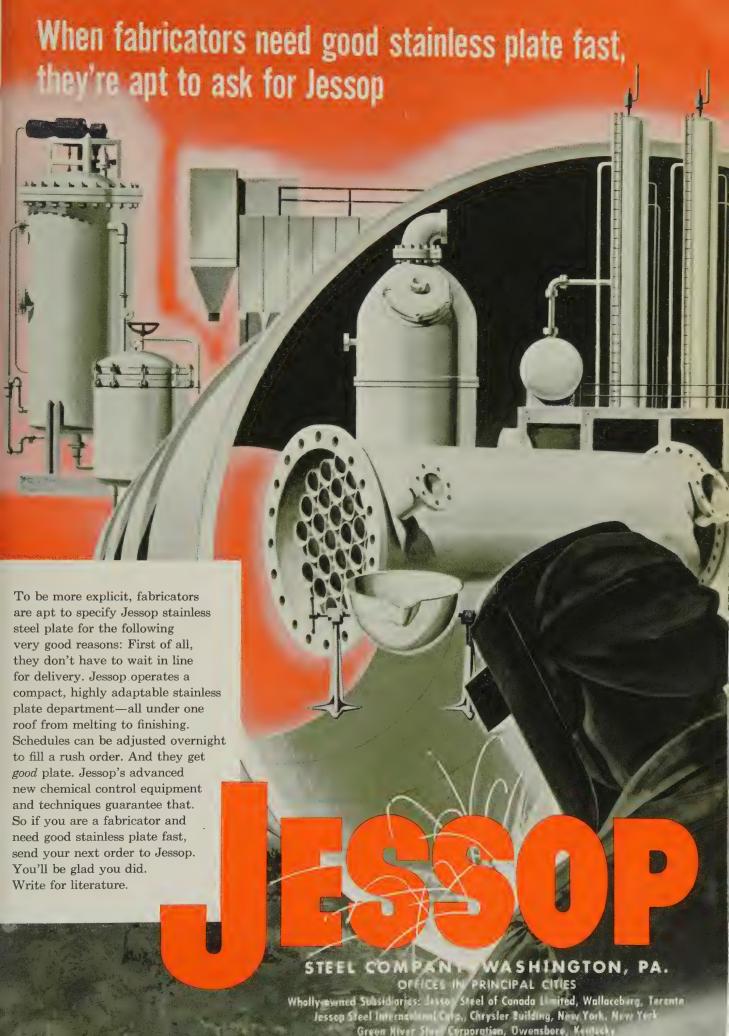
Write or call for complete details.

### DEXTER

#### FOLDER COMPANY

DIVISION OF MIEHLE-GOSS-DEXTER, INC.

General Offices: 219 East 44th Street, New York 17, New York



## BEARING TIPS by McGill

## GUIDEROL® bearings add efficiency and sealing — to greater capacity



#### Special GUIDEROL® bearings for turntable rollers

Four of these specially designed turntable rollers support the entire weight of the superstructure plus overhang-ing work load. They replaced inade-quate plain friction rollers to allow for smoother handling of even greater imposed loads with no track wear. Simplified lubrication and longer life reduced maintenance.



#### Sealed GUIDEROL® bearings for boom peak sheave

The integral seal design of these extra capacity bearings offers exceptional compactness in the Jib and Boom Peak sheaves. Unit costs are lower because counterboring for separate closures are unnecessary. Retained grease in the protected bearings eliminates climbing or lowering the boom for frequent relubrication.



## Sealed CAMROL® Cam Followers for outrigger support

Located in the outrigger carrier channels, these cam follower bearings facilitate extending the supporting outriggers. Subject to heavy working loads, these sealed bearings provide low cost and dependable anti-friction support rollers that stay clean and well lubricated.

McGill bearings have the proven quality, design advantages, extra capacity and precision required to insure the efficiency of needle required to insure the emicincy of needic type roller bearings in all modern machinery. They are specified by Thew Lorain to help make the performance of their giant 75 ton Moto-Crane smooth, rugged and reliable un-der severe operating conditions. Thew Lorain specifies McGILL bearings in all heavy duty equipment for their outstanding dependability with reduced maintenance. McGill bearings will work equally well for you. Write for Catalog No. 52-A.



for THEW LORAIN

Insure performance with McGILL® MULTIRUL® GUIDEROL® Precision Needle Bearings

McGILL MANUFACTURING COMPANY, INC.,

301 N. LAFAYETTE ST., VALPARAISO, INDIANA



## of Highest Purity

**FERROSILICONS** 

**HIGH-CARBON FERROCHROMES** 

**LOW-CARBON FERROCHROMES** 

LOW-CARBON FERROCHROME SILICONS

SILICOMANGANESE

OTHER SPECIALTY ALLOYS

Produced in modern electric furnaces at Beverly and Jackson, Ohio, plants, from top quality raw materials, Globe ferroalloys are of highest purity and meet the most exacting requirements.

Shipments are by rail, water, or truck, in lump size or crushed.

A highly competent staff of metallurgical engineers is available for consultation. We welcome your inquiry.

#### PICKANDS MATHER & CO.

Cleveland 14, Ohio

CHICAGO . CINCINNATI . DETROIT . DULUTH . ERIE . GREENSBORO . INDIANAPOLIS . NEW YORK . ST. LOUIS . WASHINGTON

Serving Industry Since 1883

IRON ORE . PIG IRON . COAL . COKE . FERROALLOYS



## 12"x 2" Disc or 200"x 132"x 2" Plate

... Carlson is your ONE source for ALL stainless steel components

STAINLESS STEEL PLATES . PLATE PRODUCTS . HEADS . RINGS

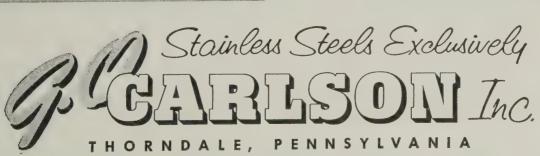


Check your drawings and you may find that you require all of the stainless steel items shown here—plates, heads, tube sheets, discs, forgings, flanges, rings, special patterns, bars, and sheets (#1 Finish) in the heavier gauges. When you buy all these material components from one source you save time, effort and money.

Your assembly costs are kept to a minimum when you use Carlson's abrasive cut material. Cleaner edges mean less true-up time on the job. There is no heat-affected zone because little heat is developed during the cutting. Fabrication is easier and the finished product is of the highest quality, more dependable in use.

Who pays freight on "offcuts" you can't use? No one, when you use Carlson's service for cutting plate to shape, ready for your fabrication. Plate is sheared, sawed, flame or abrasive cut and machined to your specifications. Eliminating freight charges on excess material lowers your costs.

There's the matter of delivery which also means time and money to you. As specialists in stainless steels, Carlson has the diversified equipment and the technical and practical knowledge to produce the plate or shapes you want, the way you want them with delivery as promised.



District Sales Offices in Principal Cities

DISCS . FORGINGS . FLANGES . BARS AND SHEETS (No. 1 Finish)

## WHY INDUSTRIAL BROWNHOIST

LOCOMOTIVE CRANES SPEED UP JOBS



TO SWITCHING CARS

Industrial Brownhoist diesel electric
locomotive cranes operate faster and
smoother due to their Diesel-Electric travel
and rotation. Operators work faster and
easter because controls are within easy
reach and Monitor Type Cab and
Clear-Vision Boom give full 360°
visibility—front, back and both sides.
Rugged construction, simplified mechanism,
and easy accessibility to all moving
parts help keep crane working with
minimum "downtime" and maintenance
costs. Built in capacities from 25 to 80
tons. Write for Catalog No. 548.

## BROWNHOIST











INDUSTRIAL BROWNHOIST CORPORA-TION, BAY CITY, MICHIGAN - DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago, San Francisco, Montreal, Canada - AGENCIES: Detroit, Birmingham, Houston

CLAMSHELL BUCKET 250 TON WRECKING CRANE COAL-ORE BRIDGE

CAR DUMPER

LOCOMOTIVE CRANE



THIS NEW HAMMER, the result of L original research and development by the Chambersburg Engineering Company, is especially designed for precision blow control and the accommodation of automatic feeding devices to perform such operations as forming, embossing, coining and re-striking in a single die impression.

Precise blow control is achieved by maintaining close pressure tolerances on the air supply and by the fine adjustment of a regulating valve on the hammer's exhaust system. These two features combined in a Chambersburgdesigned hammer structure result in a tool which offers faster, safer, effortless and more accurate production in operations requiring a single blow in a single die impression.

The Forming Drop may be arranged for manual stock handling with a standard treadle operation or mechanical feeds can be engineered and installed to suit a variety of jobs. Utilizing suitable hoppers, sorting and orienting equipment in combination with and synchronized to the hammer, many jobs can be completely mechanized.

Consult with Chambersburg engineers regarding the application of the Forming Drop and automatic feed to your job-or write for Bulletin 73-L-7.

## CHAMBERSBURG

THE HAMMER BUILDERS

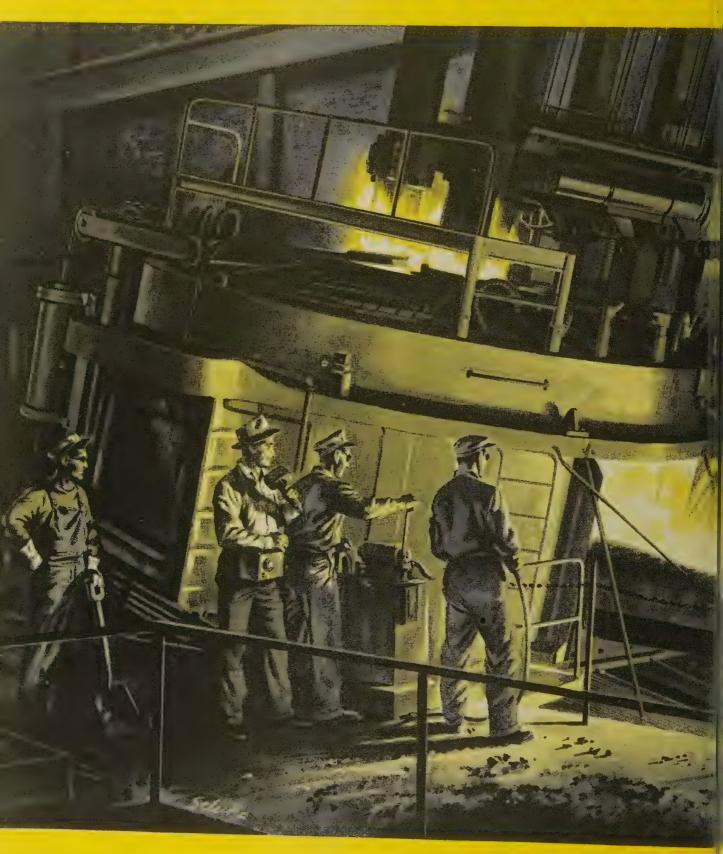
CHAMBERSBURG ENGINEERING CO.



CHAMBERSBURG, PENNSYLVANIA

April 7, 1958

## ALLIS-CHALMERS



Products for steel: motors, m-g sets, control, pumps, Texrope drive equipment, crushers, mills, screens, rectifiers, transformers, substations, switchgear, circuit breakers, turbine-generators, voltage regulators, blowers, compressors, synchronous condensers, and water conditioning equipment.

ALLIS-

## in Step with STEEL



## CHALMERS



maintenance.

balance are current with are voltage to maintain desired are condition automatically. These controls result in high tonnage per kwhr, long life for electrodes and furnace linings, and a minimum of

## Fastener Facts

by Paul Tunison, Chief Engineer-Judson L. Thomson Mfg. Co.

#### SHOULDERED RIVETS vs MACHINED PARTS

When design calls for fasteners that also function as pivots for moving parts, it pays to consider shouldered rivets first. They may look much like screw machine parts that offer similar shoulder and tenon combinations; but the similarity ends there.

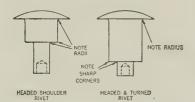
#### **Rivets Cost Less!**

Shouldered rivets cost only about half what you pay for their fully machined equivalents. That's because they can be cold-forged from solid wire in a single, high-speed operation. In most cases, no metal is removed, as with screw machine parts. So, you get all the stock you pay for.

#### Rivets Speed up Assembly!

Shouldered rivets are located and clinched by high-speed rivet-setting machines. Like semi-tubular rivets, they have shallow punched or drilled holes in their shanks to combine the shear and compression strength of solid rivets with low-cost fastening. On the other hand, comparable screw machine parts often require slow, costly hand locating and fastening.

Therefore, the savings in material and labor costs inherent in shouldered rivets demand their early consideration in cost reduction or value analysis programs. These low-cost, high-speed fasteners should be thoroughly investigated before designs are frozen in favor of more expensive screw machine parts.



#### **Thomson Shouldered Rivets**

Thomson designs and produces shouldered rivets to specifications in two forms; completely cold-headed or cold-headed and turned, depending on permissible radius of corners and break of edges.

break of edges.

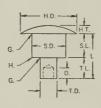
When close tolerances are not a factor as in folding baby carriages, car beds and seats, rollaway beds and comparable pivot-fastener applications, Thomson shouldered rivets are completely cold-headed . . . and, of course, priced at a minimum.

Where tighter fits are necessary, a secondary turning operation supplements the initial cold-forming to



square corners and edges to specified tolerances. Metal removal, of course is slight. As a result, these Thomson shouldered rivets cost slightly more than completely headed rivets, but much less then fully-turned parts.

#### Variables to Consider



In addition to permissible radius of corners (H) and break of edges (G), there are nine other design factors: head shape, the diameter (HD) and thickness (HT); shoulder diameter (SD)

diameter (SD) and length (SL); tenon diameter (TD) and length (TL); rivet length under head (L) and hole depth (D). Head shapes may be round, oval, flat, countersunk, or some special design. Because of all these variables, Thomson Shouldered Rivets are made to order after individual quotations.

#### Other Design Factors

It pays to think twice before you rule out shouldered rivets because of design and production consideration that seem to prevent insertion of rivet-setting machine's driver or anvil for clinching the rivets. In many cases, a slight change in spacing or cavity size allows use of rivets without changing overall dimensions. In other cases, a change in assembly sequence permits a profitable switch from costly hand assembly of expensive screw machine parts to low-cost machine-set rivets. Our engineering department, experienced in shouldered rivet applications, will be glad to offer suggestions while your designs are still in the rough-draft stage—at little or no cost.

#### Materials and Finishes

Thomson Shouldered Rivets are produced from aluminum, brass, copper, nickel-silver, low-carbon steel,

DESIGN
PRODUCTION
& PURCHASING
DATA

stainless steel and other materials. They can be plated with brass, cadmium, copper, nickel, tin, zinc, etc. They can also be oxidized or finished in japanned colors to match the original equipment or end product.

#### **Thomson High-Speed Machines**

The inherent economy of shouldered rivets as pivot-fasteners is multiplied by high-speed assembly made possible by automatic rivet-setting machines which can be operated by unskilled labor. Thomson, inventor of the first automatic-feed rivet-setting machine, has developed more than 250 styles which can do thousands of fastening jobs . . . with or without adaptations. Multiple rivet-setting heads, special work handling and loading fixtures are optional features that further accelerate assembly operations. Thomson will select and custom tool the proper machines to speed assembly and reduce costs in your plant. You can either buy or lease them and Thomson's sales-service engineers are available to keep them in top operating conditions.

#### TYPICAL RIVET-SETTING MACHINES



FLOOR-TYPE FOOT-OPERATED

FLOOR-TYPE MOTOR-OPERATED

#### Design and Engineering Service

Contacted while designs can still be modified, we will analyze your pivot-fastening problems and tell you whether shouldered rivets are best for you . . . at little or no cost. Send sketches or prints, if samples are not available.

#### Free "Fastener Fact File"

Be one of the first to profit from our new manual on all phases of riveting. It covers rivet types, applications, materials, finishes and other factors that determine selection of the right rivet design and machine for cutting

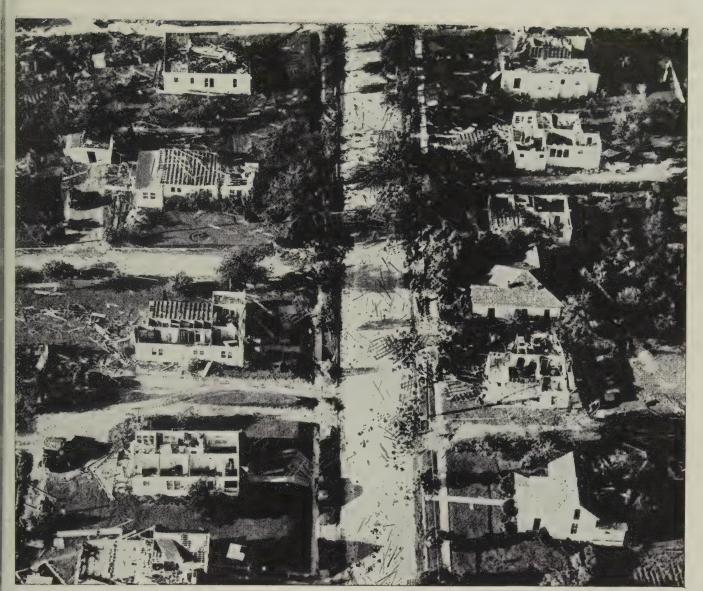
fastening costs. Reserve your copy today. Write: Judson L. Thomson, Mfg. Co., Dept. Waltham 54, Mass.





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Maple St., Small Town, U.S.A.

# A TOWN WHERE "NOTHING EVER HAPPENS"... fee

A home town—like your town. A place where people said "it couldn't happen to us."

But it *did*. Like a whip, a great tornado lashed down Maple Street, splintering houses, leaving people hurt—homeless—panic-stricken.

A desperate call went out for the Red Cross and quickly, automatically, the team went into action.

Red Cross nurses slipped into uniform . . . volunteers set up first aid stations . . . canteens fed the hungry. Later, Red Cross money and work helped rebuild the town.

Last year was one of the worst disaster years of this century, and the year before, 1956, was almost as bad. Every month and in every state, the Red Cross strained to the limit as hurricanes, floods, tornadoes, forest fires swept across the country.

Red Cross receives no government funds—depends entirely upon you for support. Give as much as you can. Your dollars may go to your own town when it needs them most.

Join and Serve



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## Precision Rings

## with little or no machining



Today you can purchase precision flash butt-welded rings that require little or no machining to meet your specifications. Made from bar stock of finished gauge, they can be produced to meet the same tolerances as conventionally machined rings. Cost of production and materials of some rings has been reduced as much as 60%. Sizes and materials at present are limited to those bar stocks which can be furnished to precise finished dimensions. However, persistent efforts of American Welding engineers and the producers of finished bars give promise of a widening range of sizes and metals that can be manufactured by precision forming and welding.

This is another example of why you should call American Welding first — if the problem is circular and of metal.



#### **New Products Catalog**

Write today for 20-page catalog of circular products which American Welding can form, weld and machine for you.



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## Metalworking Outlook

April 7, 1958

#### Aluminum vs. Stainless

The price cuts in aluminum (Page 160) probably will not bring about a change in stainless steel prices. The two metals are most competitive pricewise in auto trim and architectural applications. Says one stainless producer: "When aluminum and steel meet in the market place, we sell quality rather than price." The move in aluminum is aimed primarily at copper, particularly in electrical uses.

#### AMC To Build the Mighty Mite

George Romney, American Motors Corp.'s president, has been saying his company is phasing itself out of defensework because it couldn't get contracts. He'll have to change his tune because the Army has just awarded a \$5.5-million contract to AMC for a light truck, the Mighty Mite, which is scheduled for airborne use. Buildups aren't expected to start for a year. Other defense orders for recession-riddled Michigan industries include two contracts for \$29.6 million to Chrysler Corp. for missilework and a \$1.8 million job to Ingersoll-Kalamazoo Div. of Borg-Warner Corp. for jet assist takeoff work.

#### Housing: 1.3 Million Starts in '58

Look for housing starts to hit 1.3 million this year, instead of the 1.1 million originally predicted. The new federal housing bill will make the difference. It extends the loan programs for veterans to July 25, 1960, provides more money to buy Federal Housing Administration and veteran mortgages, lowers down payment requirements on FHA mortgages, and boosts the interest rate on GI loans to  $4\frac{3}{4}$  per cent.

#### Breaks in the Clouds

The business weather outlook is still gray, but there are breaks in the clouds: Industrial building costs have leveled off for the first time in four years, according to Austin Co.'s index. The American Gear Manufacturers Association's index for February showed volume in the gearing industry was 2.1 per cent higher than it was in January. "Productivity is clearly on the increase in many construction areas," says Austin's chairman, George A. Bryant. In the first two months of 1958, total construction awards were running 10 per cent behind 1957's pace.

#### Time To Improve Labor Policies

Now's the time to adopt sound long term industrial relations policies, says Sumner H. Slichter, Harvard economist. While some progress has been made, he believes more is needed to: Improve arrangements for handling grievances; deal better with discipline; improve production standards or wage

### Metalworking

#### Outlook

incentives; develop better job evaluation plans; and redesign seniority arrangements. A firm stand is more possible this year than in many former periods because there is less danger of strikes.

#### Hawaii To Get First Steel Mill

Mid-Pacific Rolling Mills Ltd. has been formed in the Hawaiian Islands by Harry B. Kronick and Louis Dulien, principals in National Metals Co., Honolulu, and Dulien Steel Products Co., Seattle. Mid-Pacific, to absorb National Metals' facilities, will convert Hawaiian scrap to reinforcing and structural steel for use by the islands' construction industry. A \$1-million mill is expected to be in production by January, 1959.

#### 3.7 Million-Ton Mill in Siberia Planned

Russia's expanding steel industry includes the prospective construction of an integrated plant in western Siberia. It would have a capacity of 3.7 million tons of rolled products a year and a force of 30,000 employees. Russia's Asiatic territory holds promising iron deposits, substantial coal reserves, and a large hydroelectric power potential. Anticipating a nickel shortage, Soviet metallurgists will use manganese as an austenite-forming element. The observations were made by a team from the American Institute of Mining, Metallurgical, & Petroleum Engineers which visited Russia.

#### Direct Reduction: Still Another Process

Add the Strategic-Udy Process to other entries in the race to find commercially acceptable ways to direct reduce iron ore. Strategic-Udy employs a rotary kiln for partial reduction and an electric furnace for final reduction of unbeneficiated ores to pig or semisteel. Combustible gas from the electric furnace furnishes part of the fuel. Kiln feed is iron in any form (even flue dust), flux, and cheap carbon fuel. The process isn't ready for the big steel producing centers, but Strategic Materials Corp., Niagara Falls, Ont., and Koppers Co., Pittsburgh, have joined to explore its feasibility for low-grade ore and poor fuel areas.

#### Straws in the Wind

Sharon Steel Corp. is experimenting with oxygen steelmaking and direct reduction processes . . . Copperweld Steel Co. has a new product, Alumoweld, an aluminum-covered steel rod which can be redrawn into wire; limited production starts this month . . . International Nickel Co. of Canada expects to spend \$60 million or more on capital additions in '58, compared with the previous record of \$43.9 million in '57 . . . Manufacturers' inventories, on a seasonally adjusted basis, hit \$52.5 billion at the end of February, down \$400 million from the previous month; durable goods showed the biggest liquidation . . . Britain's domestic steel prices have been cut to save users about \$28 million a year . . . National Cylinder Gas Co. will be renamed Chemetron Corp. after the chemical, metal, and electronic industries it serves.



## "How can we squeeze $2\frac{1}{2}$ out of production costs?" Add to this service

Questions like this are nothing new to Ryerson specialists.

With their broad experience in steel applications, they can often suggest ways to save—a different type or analysis, steel in ready-to-use form, or an improvement in fab-

rication methods that will shave a few pennies off the final unit cost without impairing quality. Add to this service the nation's largest steel stocks, unequaled processing facilities, fast delivery to meet any emergency—and you have the reasons why more steel users call Ryerson.



## RYERSON STEEL

Member of the MAND Steel Family

Principal Products: Carbon, alloy and stainless steel—tubing, bars, structurals, plates, sheets—aluminum, industrial plastics, metalworking machinery, etc.

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April 7, 1958



ROAD PAVER AT WORK ON DETROIT-TOLEDO EXPRESSWAY. CONTRACTOR: DENTON CONSTRUCTION CO., DETROIT, MICH.

DSC PHOTO

### DSC Electro-Welded Wire Fabric Makes Concrete Crack Resistant

WHAT IT IS—DSC Fabric is a money-saving means of supplying the needed tensile strength which concrete commonly lacks. That explains its engineering function in the building of roads and structures and in fabricating concrete pipe and other precast concrete products.

Portsmouth mesh consists of DSC Bright Basic L. C. Reinforcing Wire. The wire intersections are electrically welded to produce a continuous lattice-work mat.

DSC Fabric conforms to ASTM Specification A-185-56T—PROOF of PERFORMANCE of DSC STEEL... on the job.

**HOW IT SERVES THE PUBLIC**—DSC Fabric promotes easier, smoother, faster and *safer* highway driving; saves tax money by reducing initial and maintenance costs of public roads, structures, sewerage and general drainage systems; protects buildings against cracks, leaks, vermin.

For more information on DSC Fabric and its uses . . . or about other DSC Rod and Wire Products . . . or DSC Sheet and Strip Steel—please write DSC General Sales Office or call your nearest DSC Customer "Rep" . . . today?

Customer Satisfaction Is Our Business

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Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable St
Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip Flat Cold Rolled Carbon Spring Steel

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## CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio., Dayton, Ohio., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, Worcester, Mass., Winneconne, Wis.



## How High Is Unemployment?

Within the next few days, the U. S. government will issue its unemployment figures for March.

Reported as bare statistics, they will make distressing news that can be taken as evidence of a deepening of the recession.

In a period when psychological influences can affect our future so profoundly, we think these statistics need careful explanation and interpretation. Many of the changes in employment are resulting from a great variety of economic and social forces now at work.

Based on reports from 100 representative plants in Cleveland, it is a safe bet that national unemployment in March rose to at least 5.5 million.

That total is 300,000 higher than February's and 2.6 million higher than the year-ago figure. To find a comparable high, you must go back to 1941 when 5.6 million were unemployed.

But the number of jobless does not look so bad in terms of population growth, additions to the labor force, and the number of people still working.

This table tells the statistical story for the current period, the last two recessions, and the prewar period:

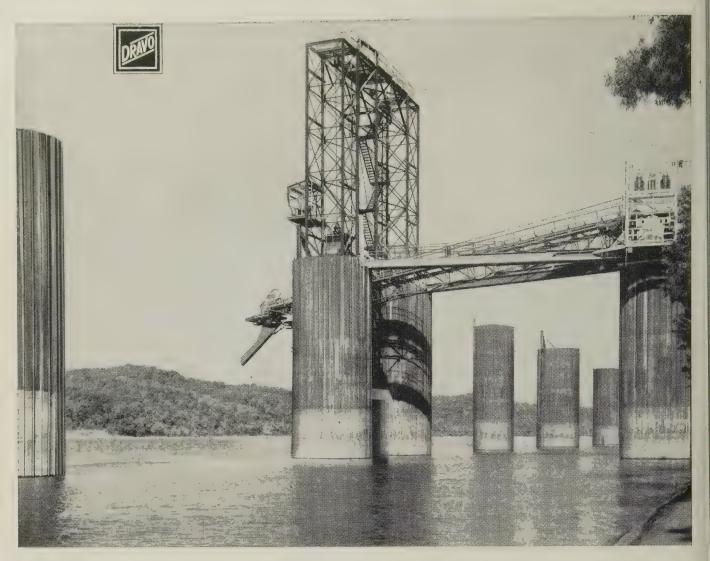
	1958	1957	1954	1949	1941
(March figures in millions)					
Population	173.2	170.3	161.5	148.0	133.0
Labor Force	67.2	66.8	63.8	61.0	55.9
Employed	61.7	63.9	60.1	57.8	50.3
Unemployed	5.5	2.9	3.7	3.2	5.6

Since 1941, population has increased more than 40 million, the labor force more than 11 million. Both are still growing. Population is gaining at a rate of 250,000 a month, the labor force 100,000 a month.

A large portion of unemployment is concentrated in metalworking, including steel, other metals, machinery, and transportation equipment. Soft goods and the trades are holding up well.

We agree that unemployment is high, but when all the facts are taken into account, we don't think the picture is as black as it appears to be. Unemployment could get still higher without becoming too alarming.

Iwin H. Such



#### "MILLION TON" dock for new DeKoven Mine

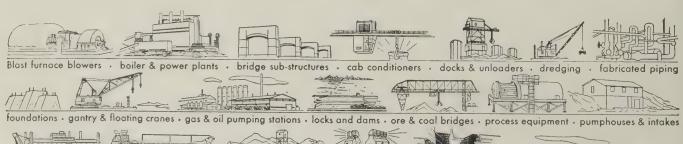
Pittsburgh & Midway Coal Mining Company can load more than a million tons of coal annually at this modern, cellular type barge dock near Sturgis, Kentucky, on the Ohio River. A two-mile long, 42 inch conveyor belt connects the facility with the company's new DeKoven

Eleven cells, three of which support the loading mechanism, are spaced along 1175 feet of shoreline. Constructed of interlocking sheets of steel piling driven to rock, each

cell is filled with sand and gravel and topped with concrete. Ruggedness, economy and minimum maintenance make this an ideal type of dock for most purposes.

In the past eight years, Dravo has installed more than 100 of these docks for firms in the chemical, steel, coal, utility, railroad, petroleum and other industries. For more information on this or any of the products and services shown below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO



river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation



Pointing skyward, the Atlas missile is one of many as . . .

## Missile Arsenal Builds Up

THE NUMBER of missiles built the next three years will be disconcertingly small for manufacturers analyzing the profit potential of our defense program. Pentagon estimates indicate about \$3 billion will be spent on missiles in 1958. Projecting the trend curve, Steel estimates spending in the 1958-60 period will approach \$13 billion.

Ballistics—About \$3 billion will pay for the production of fewer than 1000 ballistic missiles. Research and development will get \$5 billion, and

\$5 billion will remain for the production of about 30 types of non-ballistic missiles which can be produced in something approaching quantity.

A \$3 billion estimate for ballistic missiles is based on present programs and those reportedly favored by Congressional leaders:

• Atlas, if operational by 1959, should be produced at the rate of ten a month by the end of 1960. Perhaps 120 will have been produced by then.

- Polaris, scheduled to be operational by 1960, is timed with the production of submarines to fire it. Unofficial plans call for five subs to be ready by 1960, each capable of firing a dozen or so missiles. If the goal is realized, 60 Polaris missiles may be built before Jan. 1, 1961.
- Thor and Jupiter are officially scheduled to be operational by the end of this year. Unofficially, 100 may be deployed overseas. In 1959-60, guesses a source close to the missile industry, about 600 can be built without straining production facilities.

Assuming a cost of \$2 million for each Atlas and \$1 million for each Thor, Jupiter, or Polaris (industry estimates of production costs), the total tab for hardware could hit \$1 billion. Another \$2 billion would furnish ground support equipment, launching sites, spare parts, technical facilities, and submarines for the Polaris.

Nonballistics—Around \$5 billion in production money should be available for guided missiles. That would buy 8000 Snarks, or 10,000 Reguluses, or 80,000 Matadors, say industry sources. Of course, the production figures aren't possible because the \$5 billion must also finance 27 other missiles-and the production of some will hit several thousand. LaCrosse production passed the 1000 mark long ago; Falcon production will run high; Nike production of Ajax type (already over 1000) will be replaced with Hercules type.

Long Range—Polaris production will reach the 1200 mark if some congressmen get their wish for 100 launching subs—but only 360 if a reported Navy program for 30 subs over a ten-year period pans out. Totals should be doubled if back-up missiles and spare parts are counted.

Production of ICBMs will never surpass that of B-52s, which they are designed to replace. And that won't happen soon, considering recent statements by Air Force officials that the ratio of manned bombers to missiles in the Strategic Air Command will remain in favor of bombers well into the 1960s.

#### How Two Organizations Used Research Labs

#### New Product . . .

- PROBLEM—Life Time Products Corp., Los Angeles, built a portable end lift car jack for garage and service station use. But newer cars caused problems: Some were too low to get the jack under; on others, the pickup point couldn't be reached with a fixed set of hooks.
- OBJECTIVE—It took the problem to Designers for Industry, Cleveland. DFI's market survey coupled with Life Time's experience, showed a need for:

   Universal pickup arms.
   Pneumatic actuation.
   Capacity to lift 3000 lb with maximum of 150 psi air pressure.
   A 5 to 10 per cent weight reduction, compared with the old model.
   Good maneuverability.
   Ability to stand on end for storage and shipping.
- SOLUTION—The old model couldn't be modified to meet the specs, so a new concept was needed. A scissorslike mechanical linkage system and vertical placement of the pneumatic cylinder solved most of the problems. Use of formed, high tensile sheet steel instead of structural shapes for the box saved weight. Spotwelding was found to be Life Time's most economical joining method.
- RESULTS—DFI built a one-fourth scale model prototype and furnished working drawings. From start to finish, the project took six months. Side benefits: Improved appearance, savings on assembly costs, patentability.

#### New Material . . .

- PROBLEM—Wright Air Development Center, Dayton, Ohio, wanted a material suitable for bearing retainers in aircraft gas turbines. It took the problem to Horizons Inc., Cleveland.
- OBJECTIVES—Horizons' research showed that the material would need a duplex surface—one soft phase and one hard phase.

Requirements of the soft phase: 1. Low adhesive affinity. 2. Softness (but not molten) at operating temperatures. 3. Replenishable when worn away.

Requirements of the hard phase: 1. Provide a small true contact area. 2. Not interfere with lubricant action of the softer phase.

- SOLUTION—Horizons developed a heterogeneous alloy containing silver as the soft phase and a nickel-base material with silicon and molybdenum disilicide or chromium boride additives as the hard phase. Powder metallurgy was the most efficient fabrication technique. Silver was added by infiltration.
- RESULTS—1. Operating temperatures were increased to 800° F.
   Wear rates are lower at elevated temperatures than at room temperature. (Some tool steels, rubbing against the cage and seal materials, form oxide films which are tenacious and act as a lubricant. They retard wear which occurs from galling.)

## Should You Buy Research?

THREE out of five metalworking companies plan to introduce new products in 1958. Many others will bring out new processes. Numerous problems accompany such introductions. How can they be solved?

One way is to hire an independent commercial research laboratory. Numbering over 600 in the U. S. (a National Science Foundation directory lists 563 of them), they define their business as "problem solving." They should not be confused with the nearly 4000 other independent laboratories in the country that work in the areas of testing or engineering design.

The research labs' services run the gamut from basic research to product design. They also conduct technical market surveys and engineering audits, do process engineering, and tackle a wide variety of research and development problems. Most of them specialize in certain types of products, materials, or industries.

Operating as an "arm" of your company, in a staff position, they are subject to your directions.

#### When You Need One

You won't want to hire an outside firm for a problem that your own staff could readily solve. Ask yourself how big and pressing the problem is and what you will lose if it's not solved. Define the objectives and specific boundaries of

a problem before deciding whether to farm it out. Maybe it's not as difficult as it seems.

And don't settle for anything less than the best solution. Perhaps your own people could find the best mechanical answer to a problem but the most profitable one might lie in use of hydraulics, pneumatics, or electronics. That's where a lab can pay for itself fast. Here are some points to consider in determining whether to go outside:

Lack Knowhow?—Does your technical staff have the over-all knowledge to solve your problem? Outside firms bring you experience from many industries: Knowledge picked up in divergent fields can often be converted into background for your project or even a solution to your problem. The lab may have run into a similar situation before: It can make short cuts and avoid costly blind alleys. That's a good point

to consider when you're exploring a new field.

Lack Facilities?—Do you have the space and equipment needed to work on the problem? If you do, can you afford to release it from other jobs? You probably won't want to buy a lot of equipment for a temporary project. And maybe you can't afford the investment needed to do advanced research.

Says J. E. Burnett, vice president, Designers for Industry, Cleveland: "The lab can bring you the same facilities for a \$2000 project that you'd need for a \$2 million one."

And you get the added advantage of isolating your research project from day-to-day production wor-"When you take men off a research program to solve a production problem, you not only lose time but do the more serious damage of interrupting the thought of the researcher," points out Roger A. Mc-Intyre, director of sales, Horizons Inc., Cleveland.

Lack New Ideas?—A good indication that you need an outside firm is failure to come up with new ideas for solving an old problem. Perhaps a fresh outside point of view is needed. It's too easy for your own staff to develop a preconceived notion of what the end result should

It also offers you flexible thinking and "new blood." You could get that by hiring some new people, but could you profitably keep them busy with subsequent projects?

Lack Time?—In bringing out a new product or process, timing is of the utmost importance. yourself whether you'll save enough money by letting your own team develop it to make up for the probability of a later completion date.

"Because we don't have to spend as much time gathering background data and chasing down blind alleys, we can sometimes complete a project in half the time it would take a captive group," says the manager of one research lab.

Other Points-Labs also offer:

Absolute secrecy.

 Specialists for selected phases of a program.

 A solution to the technical manpower shortage.

• Complete contractural control by you of results and expenses.

 Ability to handle unusual problems.

 Cross-fertilization of ideas, drawn from fields outside your scope.

• Transition manufacturing of a new product. (They'll produce the first few for field tests or initial sales.)

· A check on your staff's conclusions.

• Tax advantages. (You can "expense" their charges.)

#### Choose the Right One

Before you go shopping, know exactly what you want the researcher to do. The more clearly and specifically you can define the problem, the more economical, rapid, and precise will be the solution. Warning: Don't select a firm until everyone in your company who must approve and work on the project understands the objectives.

Look Around — Try to visit at least two or three firms before hiring one. Examine their facilities and talk with the top management as well as the men who would work on your problem. Remember that the lab's personnel become a part of your staff while on assignment. Are they the kind of people you'd like to have on your payroll? Make sure they have the experience and interest to tackle your problem. Satisfy yourself that they'll work for you rather than your people for them.

Reputation—Find out who some of the firm's clients are and the re-

Labs Work In:

Acoustics **Aerodynamics** Aeronautics Air pollution **Automation** Bacterio logy Batteries **Building** materials Carbon Ceramics Chemical engineering Chemistry Civil engineering Coatings Combustion Computers Containers Corrosion Design Electrical engineering Electronics **Fuels** Hygiene (industrial) Ignition

Instruments

Isotopes

Lubricants Materials Mechanical engineering Metallurgy Missiles **Nuclear physics** Operations research Ore processing Paint Photography **Physics** Plastics **Propellents** Quality control Radiation Safety Sanitation Spectrography Ultrasonics Waste disposal Water Wind tunnels X-rays Plus many others

peat customers it has had. Call a client who has had a problem in the same area as yours.

Workload — Make sure the firm has the time to do the job. That's what you're paying for - time, experience, recommendations. Can it offer you a schedule consistent with your project requirements?

Warning—As in any fast-growing business, a few quacks are willing to take advantage of the unwary. That legal maxim—let the buyer beware -is good advice when you're research shopping.

The size of a firm is no absolute indication of its ability; some small labs offer topnotch specialized serv-

#### Define the Realm

When you've selected a firm, it should be asked to submit a formal proposal. That should cover:

1. Objectives—function of the project and desired end results.

2. Scope—how results should be obtained and range of activity.

3. Discourse—mutual technical understanding of the problem. It might include the lab's prior experience in this area and any development work your staff has done.

Points out Mr. McIntyre: "The client is the expert with many years of experience in his particular field. He won't want us to dig for information he has acquired at considerable time and expense."

4. Outline—detailed explanation of the functional procedure.

5. Budget—detailed estimate of dollars and time to be spent on each phase. (This is a good guide in evaluating performance while the

project is underway.)

The average cost is \$8 per manhour spent on the job, but there is seldom an average job. Yours might cost less-or more. It depends on the quality of men you'll need: Some come as high as \$150 a day. Of course, you'll be billed for any materials needed (usually with a small markup). Some labs charge overhead on facilities devoted to your project, but most include that cost in the manhour billings.

#### Bring 'Outsider' Inside

Remember that the project is a joint effort of your organization and the research lab. So chose your liaison team carefully. They'll have to answer a lot of questions during the program, so they should have a good knowledge of the problem, your organization, capabilities, limitations, policies, and procedures. The lab makes recommendations, but you must make the decisions.

Members of the liaison team should know the reasoning behind all recommendations—not only why one method was chosen but why others were not. They should equip themselves to train people needed to effect recommendations. (Some labs will do that, too, but it's generally cheaper to do it yourself.)

Maintain a close relationship between your team and the lab men. Tell your people why the research unit was called in so they won't take the move as a lack of faith in

their ability.

#### **Evaluate Performance**

Plan scheduled conferences to jointly review the project. Most labs will submit monthly progress reports. (It might be necessary to negotiate this point before hiring one.) Reports should tell what the lab did, why, with what results, and what it intends to do, why, and anticipated results. That's plus any recommendations that can be made which you might want to implement immediately. Don't force opinions until they're ripe, however.

The final results are often presented as a report. Decide in advance who'll peruse it (board of directors, technical management, production people, or all three?) and what type of report is needed (how-to-do-it, why-it-was-done, or a finished product or process ready to go to work for you).

You can call in a lab at any phase in development of your project. You can also terminate its services at any time—usually with a 30-day

notice.

When the researchers leave, the job's not done. You still have to put the results into effect and exploit your investment. You should also get to work on any other ideas turned up by the research. And the experience gained by your people should stimulate them to new technical horizons.

## Bluecollars Go White

International Business Machines initiates a policy that shifts 20,000 workers from hourly to salary basis at same pay. Company cites three employee advantages

HOURLY WAGES are extinct in International Business Machines Corp. plants. The company has put all its 20,000 hourly workers on salary.

Compensation rates remain the same: A worker who formerly made \$2 hourly gets \$80 for a 40-hour week. Overtime is unchanged: Time and one-half is paid for all work over eight hours in a day or 40 hours in one week.

Reason—IBM, a nonunion company, sees three worker benefits resulting from the move, says Ralph Harris, director of personnel:

1. Being on salary raises a worker's status at home and on the job.

2. Greater sick benefits accrue to salaried people. Hourly workers formerly received \$6 daily for the first three days of illness, then full wages up to six months. Now they'll draw full pay from the start for six months.

3. Employees' pay will no longer be docked for reasonable personal absences from work.

Philosophy — Company officials

say the program merely recognizes employees' needs and desires. T. J. Watson, president, adds: "I want this company to be thought of as the one with the greatest respect for the individual."

That philosophy sparked IBM's "open door policy." If a plant employee has a problem that can't be solved by his immediate supervisor, he can carry it all the way to the office of the president.

An indication of worker response: IBM's employee turnover consistently runs one-fifth to one-seventh of

the national average.

Attitudes—To measure employees' opinions of company personnel policies, IBM had Opinion Research Corp., Princeton, N. J., conduct a survey last month in its Poughkeepsie, N. Y., plant. Of the 8329 eligible employees, 6203 answered a confidential questionnaire.

Results: Employees like the company best for such things as pay, steady work, fringe benefits, and good working conditions. About 91 per cent thought their company was



**REMOTE CONTROL** from operator's pulpit will govern this ingot buggy built at Blaw-Knox Co.'s Wheeling, W. Va., plant. An electronic high frequency carrier system positions the car at soaking pits and mill receiving table. Ingot discharge is automatic. The car will carry ingots from pits to a new Blaw-Knox slabbing mill at Kaiser Steel Co., Fontana, Calif.

<sup>•</sup> An extra copy of this article is available until supply is exhausted. Write Editorial Service, Steel, Penton Bldg., Cleveland 13, Ohio.

tops, 71 per cent felt the same about their jobs, and 69 per cent rated their departments that way.

Salarywise, 55 per cent felt they were paid more than another company's employees doing the same job; 30 per cent thought rates were equal. (IBM bases its wage scales on three factors: Value of the job to the company; skill, education and experience required for the job, and rates of other companies for comparable jobs.)

Of greatest satisfaction to management was the answer to this question: "If you can choose, will you be working for this company five years from now?" About 56 per cent of the employees answered "certainly will"; 29 per cent said "probably will." Only 2 per cent gave a flat "no."

IBM officials won't predict whether they've set a precedent with their new salary plan, but several nonunion companies have already requested information. It's a safe bet industry will follow the experiment with interest.

#### Safety Record Set in '57

The iron and steel industry set a safety record last year, says Benjamin F. Fairless, president, American Iron & Steel Institute.

The accident rate in 1957 was 3.48 disabling injuries per million manhours worked, compared with a 12 per cent higher rate in 1956, Mr. Fairless told the President's Conference on Occupational Safety in Washington.

#### Use of Steel Is Recorded

Over 80 per cent of total steel consumption by U. S. metal fabricating industries is in 11 states, says the American Iron & Steel Institute.

Michigan leads. Ohio is next. The others, in order, are: Pennsylvania, Illinois, New York, California, Indiana, Wisconsin, New Jersey, Texas, and Missouri. Each accounted for over 1 million net tons in 1954.

The institute used statistics compiled by the Bureau of the Census for its compilation. Latest figures cover 1954 and are comparable with 1947 data.

### German Exports Dip

Decline may continue until end of summer despite fact steel industry recession is mild

THE SLIGHT RECESSION in West Germany's iron and steel industry has bottomed out. Domestic demand and output were little affected, but exports showed a definite downtrend. This is especially true of exports to nonmember countries of the European Coal & Steel Community. In March, 1957, orders from these countries totaled 230,000 tons. By January, 1958, they were down to 70,000 tons. The decline is expected to continue, possibly until the end of this summer.

Big tube producers, such as Phoenix-Rheinrohr AG and Mannesmann AG, have suffered most because they export 35 per cent of their output. Only 18 to 20 per cent of West Germany's rolled steel production is exported. Six blast furnaces have been idled and two or three plants have introduced short workweeks (24 hours), but

this has affected relatively few workers. Some plants have cut production 10 per cent.

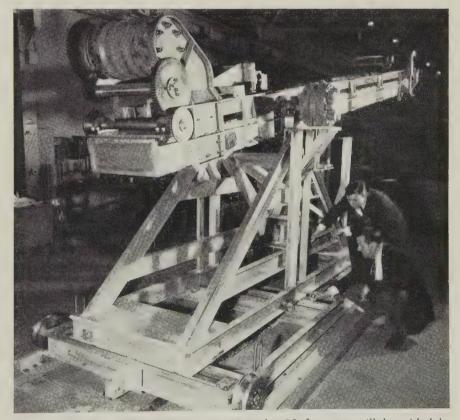
The West German steel industry's incoming orders for February, this year, were only 84 per cent of the monthly average for 1957. Result: Order backlogs are dropping.

Less Wait—Delivery dates have dropped to three or three and onehalf months as against six to eight months a year ago, and some products can be had even sooner.

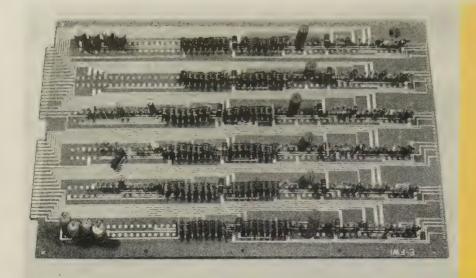
#### Steel Prefabs May Boom

Low-cost prefab steel homes and utility structures may be available in the near future, reports the American Iron & Steel Institute. It says the demand for steel prefabs comes primarily from farms and industry but that the idea of do-it-yourself homes is gaining impetus.

The institute says an entire structure can be delivered as simply as a large appliance, factory prepunched and pre-engineered, to facilitate assembly. Cement foundations are unnecessary.



HANDLING OF RADIOACTIVE MATERIALS under 18 ft water will be aided by this loading machine. It was built for Westinghouse Electric Corp. by the mechanical division of General Mills Inc., Minneapolis. The machine operates on its own small railroad tracks. It will be installed later this year in the Westinghouse testing reactor, under construction at Waltz Mill, Pa., to handle experimental containers, or "thimbles," 18 ft long and 21/2 in. in diameter



**Printed Circuit Sales** 

1962*	\$20 million
1958*	.10.4 million
1957	9.4 million
1956	8.5 million
1955	4.5 million
1954	2.3 million

\*Projected. All other figures estimated by STEEL.

Computer package utilizing printed circuits was dip soldered by Photocircuits Corp.

## **Printed Circuits Level Off**

PRINTED CIRCUIT sales flattened out somewhat in 1957 after nearly doubling annually from 1954 through 1956.

Reasons—The drop in the rate of increase is attributed to market saturation. First applied in the Manhattan Project, printed circuits are used primarily in the radio and television industry. "Indications are that this field is 85 to 90 per cent saturated," says William Mogg, sales manager, special products, Clevite Corp., Cleveland.

The leveling influence brought the demise of many small manufacturers who had entered the field with unlimited optimism but little experience or capital. A spokesman for the Institute of Printed Circuits (IPC), Chicago, says: "Overly optimistic publicity concerning profits in the field prompted innumerable small businessmen to clean out their basements and go into the business." A number of large electronic component firms have withdrawn from the field because of slim profits resulting from overcapacity and cutthroat competition.

Buyers' guide listings can be found for over 200 producers of printed circuits, but industry sources indicate less than one-fourth of these are "seriously" in the business. The IPC estimates a 38 per cent annual

turnover in the active venders in the custom fabricating field.

Future Uses — Manufacturers are looking for profits in increased volume of printed circuits in weapons (controls and guidance systems), radar, telemetering equipment, appliances (chiefly in controls for automatic washers and dryers), electronic computers, and automobiles. Says R. G. Zens, vice president, Printed Electronics Corp., Natick, Mass.: "Almost every type of industry producing in volume is investigating automation. With the growth of automatic production techniques, increased use of printed circuits will naturally follow."

Advantages—Proponents of printed circuits claim the industry has grown because of three factors: Simplicity, reliability, and lower cost

Printed circuits can replace cumbersome wiring in many types of electrical equipment. Says Mr. Zens: "It would have been almost impossible to build many types of large computers without printed circuitry." Printing has allowed increased freedom of design, simpler building, and easier repairing of items such as radios and television sets.

Manufacture—Besides those printed, some circuits are plated, etched,

embossed, pressed from powder, or stamped. Circuit bases may be of standard phenol-fiber laminates, nylon or Teflon-base materials, or any of a number of ceramics. There are also several different ways to make printed circuits.

The most popular technique begins with a drawing of the circuit which is photographed. The negative is used to transfer the pattern to the circuit board. The board may be a copper clad laminate in which case portions are etched away leaving a pattern of conductive lines. Copper can be placed on plain laminate in the desired pattern, or, if a plastic base is used, an acidresisting pigment outlines and protects areas that will form the circuit. It is also possible to coat a plastic board with photosensitive pigment and develop the image on it.

A ceramic base may be printed directly using a silk screen or by bonding an already prepared element to the base.

Problems—As printed circuits increase in popularity, testing and quality control procedures must be adapted to remain efficient. Major problems involve proper alignment and sharpness of conductive lines. Dust in the plant can create havoc with photographic techniques (dust on the negative causes a flaw in the circuit).

Still not solved completely is the problem of the proper adhesive holding the conductor to the base.

Plating and etching solutions, soldering temperature, and differential expansion and contraction of the base all make adhesion difficult.

Prices—Since the field is crowded and highly competitive, prices are continually fluctuating and price cutting has been fairly common. Indications are that expenditures for raw materials account for about 52 per cent of selling price on commercial type circuit panels, and 22 per cent on smaller quantity military, instrument, and industrial type runs.

Custom manufacturers make an estimated 43 per cent of the panels used commercially, and 70 per cent of the higher quality parts used by the military and by industry. Some companies (such as Admiral Corp., Philco Corp., or Radio Corp. of America) make circuits only for their own use.

Outlook—Look for increased use of printed circuits and a continued leveling and maturing of the industry. Sales will continue to climb, reaching an estimated \$20 million by 1962. Most "basement" producers should be out of the field by then.

Consensus among successful manufacturers: Printed circuits can offer a lucrative future—if the producer has sufficient knowhow and capital.

## No Wage Hike till November

RECOGNITION of the economic facts of life is beginning to appear on both sides of the bargaining table.

Minneapolis-Moline Co. and United Auto Workers' Locals 1132 and 1146 have worked out an agreement deferring a 10 cents an hour wage hike until Nov. 1, the start of M-M's 1959 fiscal year. Other features include: 1. Improvement in the vacation plan starting in 1959. 2. A review (beginning July 1) of certain skilled trade classifications. Some adjustments are possible.

"Our bargaining sessions were realistic," says Paul McDonald, industrial relations manager. "We told the union our operating results did not justify a wage increase at this time. They were well aware of the economic situation, and negotiations moved in that atmosphere."

Minneapolis-Moline lost over \$5.3 million in the last two years and reported another \$2.2 million loss in the first 1958 fiscal quarter, ended Jan. 31.

Financial problems led to election of a new president, J. Russell Duncan, last November.

Labor relations at M-M have generally been good. It had a six-week strike over a noneconomic issue in 1946. The only other stoppage was a wildcat strike in 1939.

About 20 per cent of M-M's employees are laid off now.

Another Example—A midwest machine tool builder has gained a year's grace from the International Association of Machinists—no wage increase in 1958. But, in return, the company will grant a 24 cents an hour wage hike in 1959: Employees will get a six-cent hourly boost each quarter.

## Republic Unveils Order Process System

REPUBLIC STEEL CORP's new order processing system can place a mill order form on the mill the same day it is received at a district sales office. Previously, it took a week for an order to reach scheduling at the mill.

The "Order Service System," is based on Republic's teletype network. The machines are provided with special keyboards which allow duplication of mill order forms, shipping schedules, shipping notices, control records, and invoices.

Procedure — When orders are written, a punched paper tape is generated by the teletype machine. After the tape transmits the order to the home office service center, it is stored for use when the customer reorders the item.

As the order comes over the teletype at the service center, another tape is generated, along with a paper copy of the order form. That tape is used to transmit the order to the proper mill.

When the order hits the mill level, a third tape is generated and used to write shipping notices and the customer's invoice. In the case of all but new customers, automatic credit and traffic routing information for the order is on the master tape.

Service Centers—The system links district sales offices to centrally situated centers where customer's inquiries are answered and orders are processed and scheduled to producing mills.

Teams of specially trained men

head up the service centers. On each team is a metallurgist, a sales order expert, and a mill schedule specialist. They have authority to reassign an order to the most available mill, advise the mill of unusual quality requirements, and establish production priority.

Results—The speed and efficiency of the system make possible a new single basic form for sales, order, and billing functions. It replaces 33 forms. Regardless of product, the multipurpose form supplies all necessary information and eliminates duplication and chance of error.

Research and installation of the new system was under direction of a committee headed by Edwin C. Mausz.



#### Concentration in Missiles?

THE NATION'S newest industry, missilemaking, is readying itself for an accusation that too much business is concentrated in too few large companies. An important watchdog, Sen. George Smathers (D., Fla.), chairman of the Government Procurement Subcommittee, has gathered facts on the relation of government furnished equipment (GFE) to contractor furnished equipment (CFE): GFE is contracted for by the government, then handed to the prime contractor for inclusion in the missile; CEF subcontracts originate with the prime.

Larger companies will contend that there are at least 40 principal contractors for about 40 missile programs: That, they think, is a much better ratio than in aircraft, where 12 companies tend to dominate the industry

They say CFE is necessary to get the program moving fast, but that the conversion to GFE is made as rapidly as the Pentagon wants it. The number of CFE suppliers who get the same contracts after conversion to GFE will be checked into closely by Senator Smathers. Small business proponents don't think conversion helps them because only CFE suppliers gain the knowhow to build the stuff. They think more equipment must originate as GFE to insure that the missile business will be spread around.

#### **AMRI Launches Its Program**

The Association of Missile & Rocket Industries, Washington, picked up the ball last week in Cleveland by inviting interested companies to tell their troubles to procurement representatives from the three services.

From the floor came such plain-spoken inquiries as: 1. Why are some large manufacturers of ground support equipment willing to take big losses on contracts? 2. What will the services do to prevent large firms from handing their subcontracting to their own divisions or subsidiaries? 3. Why is it sometimes necessary to hand-carry a firm's record of missile capabilities from office to office within a single service to convince anyone that a firm can do a job?

One manufacturer charged that a maker of ground support equipment is losing more than \$3000 each on 200 units. Implication of the charge: Loss leaders in missiles are the rule rather than the exception, despite reports from the General Accounting Office of the government that such firms as Chrysler Corp. were paying too much for equipment.

#### FHA Help for Air Conditioning

Central air conditioning for homes is getting a bigg boost from the Federal Housing Administration. Commissioner Norman Mason believes the agency should "encourage" its inclusion in FHA-insured home mortgages.

Mr. Mason states his case this way: Savings on such things as cleaning, laundry, and medical expenses offset operating costs. He thinks regional FHA representatives should not consider operating costs if a home is worth more than \$15,000. FHA reasons that homes without air conditioning could quickly lose value.

#### Small Business Tax Help Coming?

Washington sources close to the House Ways & Means Committee think some help for small firms will come this year, even if tax cuts for corporations and individuals are scuttled. On the Senate side, Sen. John Sparkman (D., Ala.) reports 35 cosponsors for a bill (S. 3194) to provide a reinvestment allowance.

A deduction from income would be allowed for increased investment in inventory or depreciable assets. Fifty per cent would be allowed on the first \$10,000 of eligible investment; 30 per cent on the second \$10,000; 20 per cent on the third \$10,000.

Other provisions include deduction for money invested in retirement plans, installment paying of estate taxes, and extended depreciation allowances on used equipment.

#### School Construction May Come Yet

Why hasn't the administration come forth with a program for school construction to combat the recession? The question is dominating inner circle conversations this week in Washington. Rumor has it that a program will be offered later in the year if the recession isn't over by then, but the school folks can't figure the President's apparent radical change of heart since last year's budget message.

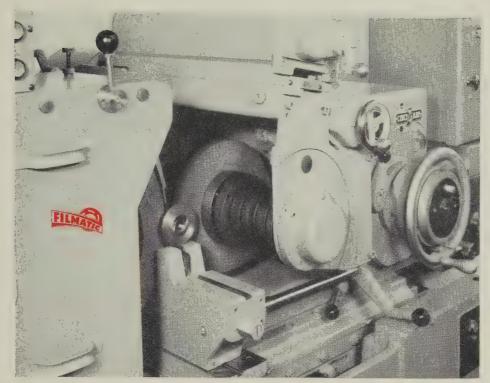
Best guess for the new attitude is a decision to play along with states' rights advocates in the hope that the Republican party can shed its "too liberal" reputation gathered during the Eisenhower administration.

#### FTC Consent Decrees Examined

The House Antitrust Subcommittee wants to know if antitrust violators are getting away with something via consent decrees with the Federal Trade Commission. Under investigation is the decree signed with Western Electric Co. Inc. and American Telephone & Telegraph Co. two years ago. The point, says a committee spokesman: The consent decree didn't cover any of the charges against Western Electric and AT&T originally made by the government.

FTC reports it is cleaning up its case load these days so violators of antitrust laws obtain quick judgment, but the House committee believes too many cases are called off via the consent route. In 1957, of 204 orders issued by FTC, 156 were consent decrees.

68



Several automatic features incorporated in this CINCINNATI FILMATIC No. 2 Centerless Grinder reduce nonproductive time in centerless grinding two diameters on turbine shafts.

## Automatic Grinding Cycle Incorporates Wheel Truing

Give the operator an assist with nonproductive chores and he'll accomplish more. One way to do it is to automate as many nonproductive elements as possible in the cost of machining. Cincinnati grinding specialists proceeded along these lines in equipping a cincinnati® filmatic No. 2 Centerless to grind two diameters on turbine shafts. Automatic features for reducing nonproductive time include:

Automatic profile truing for grinding wheel, including cycle counter

Automatic grinding wheel balancing

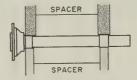
Automatic grinding wheel reciprocating, with truing interlock

Automatic Electro-Hydraulic Infeed

These cost-reducing features are in addition to well-known Cincinnati advantages such as bed rock mounting of grinding wheel spindle; FILMATIC grinding wheel spindle bearings; double slide support for the regulating wheel unit. Cincinnati is unquestionably the best buy for your precision centerless grinding work. Get additional details by asking for catalog No. G-644-3, or look in Sweet's Machine Tool File for brief specifications.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO





Drawing of part showing diameters ground.

Production Data:





CENTERTYPE GRINDING MACHINES

• MICRO-CENTRIC GRINDING MACHINES

• CENTERLESS GRINDING MACHINES

• ROLL GRINDING MACHINES

• SURFACE

GRINDING MACHINES

• CENTERLESS LAPPING MACHINES

### plan with

Time and again, engineers and designers plan with Copper and its alloys when there's a tough job to be done. For instance, the American railroads, in an effort to eliminate crippling "hot boxes" have been experiencing great success with a new self-lubricating cartridge-type journal bearing. Each of these bearings contains 75 pounds of bronze...a Copper alloy.

### save with

These new cartridge bearings, produced by the American Brake Shoe Company are proving to stand up to great impact, require very little maintenance, provide long life and greatly minimize the chance of "hot boxes" ... thus effecting great economies for the railroads.

### rely on

The next time you're faced with a challenging problem, think first of Copper! For Copper has distinctive qualities you'll find in no other metal. It resists corrosion, is unexcelled as a commercial heat transfer agent, is the best commercial conductor of electricity. In addition, Copper and its alloys are easy to work, form, draw, join, stamp, polish and plate. And there's an ample supply to meet all of your current and future needs.

Address any inquiries about Copper to The Copper & Brass Research Association 420 Lexington Ave., New York 17, N. Y.





### How To Sell Ideas to Bosses

They're looking for ways to boost efficiency. Their managers in production, engineering, and purchasing often have ideas but can't sell them. Here are clues to a solution

JOE JONES, production manager for Technoprint Co., has figured how a new handling unit can lower his shop's unit production costs. The handling unit will cost \$18,000 installed. It will save the company \$12,000 the first year. Joe has figured carefully. He knows his figures are right. He knows the company can't afford not to buy the new unit. But he just doesn't know how to sell his idea to Mr. Black, Technoprint's president.

Joe feels frustrated. His company fails to profit from a solid

Steel's editors have turned up many such incidents in the pursuance of its Cost Crisis campaign. Selling ideas to management is one of the great bugaboos confronting middle management in metalworking plants everywhere.

Wanted: A Solution-How do you sell ideas to top management? The editors of STEEL presented the question to a panel of ten Cleveland metalworking executives in a brainstorming session (see photo).

The ten brainstormers, representing various levels of management, agree that the problem is universal. They realize it causes widespread frustration among the managers in the lower echelons and is expensive because companies are losing costsaving opportunities through imperfect communications.

Money for Equipment—Top management has tightened its purse strings during the current recession, but the brainstormers are confident that most companies are able and willing to spend money for new capital equipment when it is demonstrated that the equipment will lower unit production costs sufficiently to pay for itself within a reasonable period.

They offer advice on four aspects of selling ideas to top management: 1. Creating the climate. 2. PreparPANEL MEMBERS, left to right. . .

PANEL MEMBERS, left to right. . .

I. L. STRIMPLE, president National Acme Co.

E. L. SPENCER, vice president-general manager, Fairmount Tool & Forging Inc.

HOWARD WILLIAMS, director of purchasing, Eaton Mfg. Co.

JOHN S. MORGAN, associate managing editor, STEEL.

GEORGE E. WILLIS, superintendent Electrode Div., Lincoln Electric Co.

WILLIAM I. ONG, assistant to the president, American Steel & Wire Div., U. S. Steel Corp.

WALTER J. CAMPBELL, editor, STEEL.

ROBERT F. HUBER, machine tool editor, STEEL.

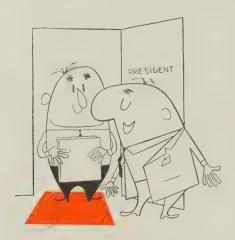
HOWARD GEYER, director of quality control, Warner & Swasey Co.

WILLIAM BENNINGHOFF, vice president. guality control, Warner & Swasey Co.
WILLIAM BENNINGHOFF, vice presidentgeneral manager, Tocco Div., Ohio Crankshaft Co.
RUSSELL L. SMITH, superintendent Brush Div., Osborn Mfg. Co.
HENRY SPITZHOFF, vice president Robert Heller & Associates
C. P. MCCABE, assistant vice presidentoperations, Republic Steel Corp.



#### **COST CRISIS COMPETITION**

This article is part of a campaign to help industry achieve lower unit production costs. The editors of STEEL are searching for companies that have brought about important cost savings through more efficient use of capital equipment. Does your company qualify? If so, enter the Cost Crisis Competition. Write to the Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio, for your awards kit. An extra copy of this article is available until supply is exhausted. Write to Editorial Service, STEEL.



#### Creating the Climate

- 1. Top management must make known its eagerness to receive ideas from secondary levels of management and supervision.
- Management must establish procedures by which ideas can be passed upward. It may specify when certain links in the chain of command may be bypassed. Emphasize the president's door is always open.
- Management should make the company's needs known to encourage the search for ideas that are consonant with the over-all plan.
- 4. Communication is a two-way street. Management must listen to ideas, then play back to the originator the disposition—and why.
- 5. A capital spending forecast should be drawn up periodically and made known to the various levels of management and supervision. It will enable them to improve timing and keep suggestions in line with what can be spent.
- 6. Beyond planned expenditures, management should emphasize that it will spend more if the exceptional idea merits it. Keep looking for ideas to lower unit costs all through the year, not just at appropriation time. The exceptional idea may be one you can't ignore.



#### **Preparing the Case**

- 1. Be careful of your timing. Don't try to sell management on ways to lower the costs of making toasters if the company is going out of the toaster business.
- 2. Begin with the idea. Be sure it is clearly presented.
- 3. State its benefits to your company. Enumerate the benefits one by one. Don't overstate your argument.
- 4. Make certain your proposal to top management offers an attractive return on cost. Many companies veto ideas that can't be written off in three years or less.
- 5. Get facts and figures to support your case. A little mathematics is worth a lot of words.
- 6. If assumptions must be made, identify them as such. The fewer assumptions and the more facts you can muster, the greater are your chances for success.
- 7. Organize supporting material.
- 8. Anticipate objections to the idea. Be prepared to answer as many as possible.

ing the case for the idea. 3. Presenting idea. 4. Clearing the channels for idea transmission from the originators to top management (see checklists above).

Boss's Job — Responsibility for creating a climate that permits ideas to flow upward belongs to top management, the panel says. The boss has to make clear that he expects middle managers to come up

with ideas, that he will listen to them, and will let the originator know what decision is reached.

Several panel members noted they get many more ideas than they can accept. Management's problem is to select the best.

The originator's problem is to present his idea in the most effective manner possible.

Favored suggestion for finding the

most outstanding ideas: Let an idea-evaluating group study the proposals.

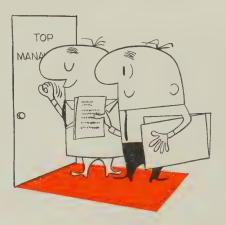
Consensus for idea submitters: Make it simple; make it mathematical; and present it with conviction.

No Fortitude?—Middle management often is too timid, too easily discouraged, charge the panelists. "Put more guts in your presentation," advises one. Top manage-



#### **Presenting the Case**

- Enlist aid from your associates. Your advertising department can help with charts and graphics. Research may have facts and figures you need. Sales can give tips on merchandising the idea.
- 2. Try out your presentation on your associates. Listen to their comments. Don't argue. Talking it over will uncover flaws, suggest ways to improve.
- 3. State your case simply. Simplicity begets clarity.
- 4. Use charts and graphics if they will help to communicate your ideas quicker and with greater clarity.
- 5. If presentation is written, emphasize the salient points in headlines. Underscore them.
- 6. If you believe in your idea, have the guts to fight for it. Gamble a little.
- 7. After presenting the case, briefly summarize costs, benefits, potential benefits. Make your recommendation. Don't forget to ask for the sale.



#### Clearing the Channels

- 1. Top management has the primary responsibility to keep open the channels of communication between the originators of ideas and those empowered to act upon them. If the channels get clogged, many cost reducing ideas will never bear profit fruits.
- 2. Top management should let its secondary level of management and supervision know that it expects them to develop ideas to lower unit production costs and to increase efficiency.
- 3. If an intermediate boss wants to hog the credit for a subordinate's ideas and if management has not opened direct channels, the subordinate manager may be wise to let the credit go to his superior a few times. Eventually, truth will out.
- 4. If an intermediate boss bars communication between subordinates and top management, the obstructionist should be bypassed.
- 5. If the intermediate persists in clogging the channels, he may have to be fired.
- 6. Usually, a suggestion system offers an effective way of getting around obstructionists. Ideas are fed into a screening committee, then to top management.

ment men on the panel recognize that production supervisors, engineering managers, and purchasing directors often are not skilled in selling, often fear they are inarticulate.

Obstructionists — Another problem, which the panel found difficult, is how to deal with the intermediate boss who persists in either hogging the credit for subordinates' ideas or in blocking them off from communication with the top boss.

They agree it's top management's job to handle this individual and to clear channels around him. If he persists, the only cure may be to fire him. "But even these guys may perform valuable functions. You can't fire them all."

The Major Task—Top management's chief responsibility, the

brainstormers believe, is to ferret out good ideas. "Your middle managers," says one executive, "should all know your sales prospects, your capital spending budget, long-range plans, and anything else affecting new ideas."

In short, good communications are central to the problem of how to sell ideas. The secret weapon: No secrets.

#### letters from production men...



#### Cost Savings: 47%

For maximum production at reduced costs, the taper attachment on a 7A Jones & Lamson Turret Lathe has proved to be invaluable. Our type of manufacturing is mostly of a small quantity, job-shop nature, but we do manufacture large quantities of tapered sleeves.

The original method for producing these sleeves called for a bar-feed turret lathe to rough out the blanks with an engine lathe being used to finish bore and ream the internal taper and turn

the external taper.

Our present method specifies boring and turning both tapers on a 7A Jones & Lamson Turret Lathe with no subsequent engine lathe operation. This results in a cost savings of approximately

47%.

The old method resulted in double handling, high cost, and wasted floor space. The new method, using the Jones & Lamson taper attachment, assures accurate, concentric tapers at a minimum cost.

— Planning Engineer —

#### Little things paid off

Of course J & L turret lathes have all the major requirements of a good machine tool — Rigidity, Power, Accuracy; but I believe their superiority is due to the little things that pay off in production, such as the J & L feature: "Automatic Internal Delivery of Coolant to Each Turret Pacificar."

"Automatic Internal Delivery of Coolant to Each Turret Position".

Here is how this feature paid off in the chasing of 1" – 8" Class II threads on long forged and heat treated stress rods and bolts. On other equipment these parts were threaded at 23 R.P.M., with a tool life of about 4 hours. Thus, two tool changes were required per shift. When the job was shifted to a J & L turret lathe it was possible to pipe the coolant directly into the die head, so that the coolant intimately flooded all cutting edges and carried both the heat and chips away from the

cutting area. This permitted a 350% increase in cutting speed, and with only one tool change required every 2½ shifts. This resulted in a real cost reduction, and the increased speed produced a superior finish on the threads.

— Production Supt. —

#### Accuracy improves 60 %

The Jones & Lamson No. 3 Universal Ram Type Turret Lathe with spindle speeds up to 1500 R.P.M. enables us to use high velocity turning with carbide tools, which we feel is a big factor in the reduction of cost per piece manufactured. Also the single lever carriage and turret feed selector have been big factors in reducing machine time. The rigidity of this machine helps us attain tolerances of .0005", which must be held in the work we constantly perform on these machines. Since the installation of six of this type of machine our production and quality of work has improved about 60 to 70%.

— Machinist —

#### Saved \$30 per part

Our new J & L 10B Turret Lathe, with its cross slide and power indexing turret with multiple stop stations, will save us \$30.00 per part, or 50% of present cost over any other available machining method.

- Director of Purchasing -

#### Saved \$40,000 a year

The #5 Jones & Lamson Turret Lathe with Hydraulic Tracing Attachment has given us quality, production, and savings on contour machining of Stainless Steel Forgings.

This contour was originally rough machined, then traced in separate op-

With the improved method, the Jones & Lamson Hydraulic Tracing Attachment is mounted on the back slide, leaving the front slide free to use the square and hex turrets for rough machining.

These parts are now rough and finished machined in one operation, saving \$40,000 per year.

The work piece is located on a face plate fixture weighing 80 lbs. and traced with a carbide tool at a spindle speed of 1040 R.P.M. and a feed rate of .00125

The 30 micro inch finish and .001 of an inch tolerance required on this contour is maintained only because of the rugged construction and built-in accuracy, characteristic in all Jones & Lamson products.

— Methods Engineer —

#### Never had a failure

The No. 5-3 Turret Lathe is the only Jones & Lamson machine in our shop. I wish we had more of its kind.

(names of these customers available on request)

This lathe is most suitable for our type of production, which consists of small series, because it can be set up quickly. We treasure this machine for its accuracy in small and big work.

The "Single Lever Speed Selector" and the "Hydraulic Collet Chuck" are features which are highly appreciated by the operators.

But the appraisal would be incomplete without giving credit to its outstanding ruggedness.

We have run this machine for the past two years at 24 hours a day on a six-day week and never had a failure.

Tool Designer -

#### Production increased 4 to 1

The Hydraulic Tracing Attachment which we are using on a No. 5 J & L Ram type Turret Lathe has proved to be the most useful to me as Shop Superintendent. Production has increased four to one since installation of the attachment three years ago. The accuracy of the parts made on the above machine determines the final performance of our product. Before using the Hydraulic Tracer our rejects were high and production was low. The success of the tracing attachment relieved us of one of our major manufacturing problems.

The work performed has to be held to close tolerance. It is the final contouring of Valve Plugs in all grades of stainless steel and hardfaced or heat treated metal. Combined with Masters made from our stock parts and carbide tooling, the cost of templates and tools is comparatively low. The combination of a turret lathe and tracer control also simplifies our setups and results in reduced cost. In fact, the setup time we save by use of masters accounts for fifty percent of our savings.

savings.
— Plant Supt. —

#### Consistent on plunge cuts to $\pm .002$

Our J & L #3 Universal Turret Lathe, once it is set up, constantly repeats on plunge cuts to a  $\pm$ .002 and on regular forming cuts holds to  $\pm$ .001 between centers.

This feature allowed us to eliminate a grinding operation, on an ordnance contract part, at a considerable saving. Said part being a steel casting pintle wt. 13# shank end.

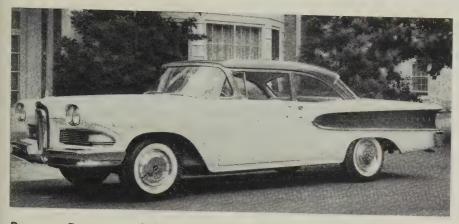
We are at present using the lathe for our regular production of conduit fittings and parts, and the knowledge that accuracy is a known factor is quite a morale builder to both management

and production.

It is surprising how much respect can be gained between management and production in the use of such equipment, and the satisfaction the production worker is given when he knows he can depend on consistent performance of his equipment.

— Plant Engineer —

517 CLINTON ST., SPRINGFIELD, VT.



Ranger-Pacer models will stay . . .



Corsair-Citation jobs will go as...

## Ford Calls Time on Edsel

EDSEL has 90 days to produce or its sales and dealer organization will be washed out, say Ford middle management people close to the situation.

It doesn't mean the line will be junked. But it would be absorbed by either Ford or Mercury dealers, depending on which group needs the sales appeal an extra car may offer. Many Edsel dealers will have a chance to switch over to Ford or Mercury.

Background—Looking back over Edsel's brief history (it was introduced last September), these seem to be the facts that have made Ford management put it on the spot:

Originally, Edsel was shooting for 200,000 sales in its first year. That averages out to about 650 sales per working day. Shortly after the first of the year, the company realized the 1958 market couldn't absorb that many cars, and it lowered its sights to 120,000 units (400 cars per day).

At that time, the Edsel Div. had some 1200 active dealers and prospects of signing on more. It also had 24 district sales offices (each staffed by about 18 men) to service and distribute cars to dealers.

Slide Starts—Since the first of the

year, sales have steadily gone down. They are now running about 72 per day, say company sources.

The 24 district sales offices have been cut to 14; in the remaining, a 40 per cent cut has been made in personnel. Only one staffman remains in each of ten field offices that have been trimmed back.

In addition, Edsel has been absorbed into the recently formed Mercury - Edsel - Lincoln (M-E-L) Div., and about half the Edsel crew that started the year has left.

Dealers Dropping—Edsel's 1200 dealers are still active—on paper. The company is holding the contracts open on these dealerships, say Steel's informants. Actually, more than 200 of the dealers have closed their doors. It is believed that less than 1000 are in operation.

Edsel's only producing plant is the one in Louisville. Occasionally, Corsairs and Citations are built at Ford's Wayne, Mich., facility. Edsel started model buildups at a 4000 to 5000 weekly rate late last summer. By December, the pace had dropped to less than 1000 a week; more recently, production has been running between 300 and 400 every other week.

Sales Reports—Edsel reportedly has built about 58,000 cars and has sold 40,000, although some 1800 to 2000 are registered in Ford Motor Co.'s name.

Edsel dealers have an inventory of roughly 18,000 cars. Company sources indicate dealers will have to sell 200 cars daily to work off these stocks by the time the deadline runs out. Current production is expected to be enough to keep stocks from sliding to zero.

Time's Up—By the end of June, Ford management will know whether it will have to scrap Edsel's marketing setup or whether the "E" car still can be sold as a separate line.

Some talk has it that Robert S. McNamara, group vice president in charge of the company's car and truck division, wanted to junk the whole program much earlier, but it was kept alive through the efforts of James J. Nance, head of the M-E-L Div. Insiders suggest it may be a victory for Mr. Nance

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FORD'S GERMAN-BUILT TAUNUS will go on sale in the U.S. next month. Built on a 102.5 in. wheelbase with a 172.2 in. over-all length, it's 57.7 in. high, 65.7 in. wide, and carries five passengers. It's powered by a 4 cylinder, 67 hp engine with 103.6 cu in. displacement and a 7.1:1 compression ratio. Test runs indicate the car averages 35.3 mpg; cruising speed is 78 mph. Six models will be offered

if Edsel retains its own marketing group. If it has to be absorbed into other product lines, it may be a point in Mr. McNamara's favor (see Steel, Mar. 17, p. 57).

Changes Ahead—No matter what happens, Edsel won't keep the four models it started with. The top priced Corsair and Citation jobs will be gone next year. Ranger and Pacer models will be built on separate wheelbases, but with a single body for both cars. (The Pacer will presumably have an extended body.)

Edsel already has said it will continue the same basic styling theme for 1959. This means the oval grille will be retained. So will the rear lights, although they'll be placed below the rear deck lid so Edsel can utilize Ford quarter panels.

Edsel will offer three engines, ranging from 300 down to around 190 hp in an effort to play up fuel economy. The E-475 engine, introduced in the Corsair and Citation cars, will be gone.

Long Look Forward—Economic conditions may explain Edsel's sad start. Little blame for timing can be attached to the company. Committed several years in advance, it couldn't pull back when signs of a downturn started to appear.

Hindsight indicates Ford might have done better if it had brought out the Edsel as Mercury was in 1938. It was turned over to Ford dealers who were told, in effect, to see what they could do with the car. Over the years, Mercury grew

until it gained the status of a separate product line.

Supposedly, this was the course Mr. McNamara wanted for Edsel. Now he may have his chance. In time, Edsel may regain its strength and be capable of standing on its own four wheels.

#### Members Nick UAW

Negotiations between the UAW and Ford Motor Co., General Motors Corp., and Chrysler Corp. have been going quietly and on schedule. Fireworks aren't expected for at least a month. Currently, all parties are looking over demands which have been presented.

Chrysler is expecting trouble with its job transfer clauses. Ford and GM are in for plenty of talk about profit sharing, but the real hammering will come on productivity standards (Steel, Mar. 31, p. 49).

The UAW also faces trouble within its ranks. UAW headquarters was picketed ten days ago by members of Local 1284 (Chrysler MoPar) who protested being bumped from their jobs when Chrysler moved some of its operations from Detroit to Marysville, Mich.

While the UAW International hurriedly set up a grievance committee to listen to the seniority gripes of the members, two AFL-CIO unions joined last week in an effort to recruit more skilled workers from the UAW.

The Pattern Makers League of America and the International Union of Operating Engineers have filed petitions with the NLRB asking for representation elections at Ford's Livonia, Mich., transmission plant, GM's Fisher Body Plant No. 1, Flint, Mich., Chevrolet's experimental engineering department, and the Truck & Coach Div., Pontiac, Mich.

The NLRB also has received a petition asking decertification for 31 tool and die workers at the Oldsmobile plant in Lansing, Mich. All told, an estimated 3500 skilled workers are involved, says Thomas Roumell, regional NLRB director. He adds that first hearings on the Ford petitions will be held this week.

That makes four skilled trades groups bent on taking a bite out of UAW memberships. The Society of Skilled Trades and the American Federation of Skilled Crafts earlier filed about 30 petitions with the NLRB.

Although the petitions could complicate UAW negotiations with the Big Three, it looks like auto contracts can be signed anyway by including a clause which will leave the way open for special settlements if the skilled trades groups succeed in their efforts.

#### U. S. Auto Output

U. 3. AUT	o Out	грит
Passeng	er Only	
	1958	1957
January	489,357	641,591
February	392,112	571,098
March	360,000†	578,826
3 Mo. Total 1,	241,469	1,791,515
April		549,239
May		531,365
June		500,271
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,315
1771- 1731-3	40.00	
Week Ended	1958	1957
Mar. I	91,508	140,362
Mar. 8	83,892	140,161
Mar. 15	86,447	141,038
Mar. 22	80,560	138,646
Mar. 29	92,482†	130,233
Apr. 5	83,000*	130,318

Source: Ward's Automotive Reports. †Preliminary. \*Estimated by STEEL.

## Salt bath heat treating helps put you in a better competitive situation!

The Ajax files are full of case history records such as these. Each represents a typical instance where replacement of other heat treating systems with Ajax Salt Baths have meant important cost reductions or greatly improved quality—and usually both:

\$37,000 WAS SAVED in 8-months by an Ohio manufacturer through using an Ajax Electric Salt Bath installation for 4 different cost-cutting operations i.e. carburizing, simultaneous carburizing and brazing; brazing; and hardening.

A 350% PRODUCTION INCREASE in 45% less space with 50% less labor was achieved in carburizing bearing races in a 6-unit Ajax Electric Salt Bath installation.

A 60% COST REDUCTION in case hardening body screws was scored by a single Ajax Salt Bath no larger than your desk but handling 390 lbs. of work per hour.

AN 80% REDUCTION in finish grinding time was obtained by martempering SAE-52100 bearing races in an Ajax installation. Drawn to Rc 62-63, the races showed average out-of-round distortion of only 0.002-0.003".

Ajax Engineering Corp.

Ajax Electrothermic Corp.

A 4 TO 5 TIME LIFE INCREASE for rock bits resulted from Ajax Salt Bath hardening which also made possible use of plain carbon rather than costly alloy steel. 480 lbs. of work per hour are handled in a bath only 36" x 11" x 36".

#### SIMULTANEOUS CARBURIZING AND BRAZING

of a complicated motor starting assembly are done in one Ajax furnace with one heating of the work as compared to two heatings previously required.

Savings like these are vitally important—and Ajax can help you to realize them to the fullest extent.

The chief product of Ajax is applied heat treating "know how"... not merely the largest assortment of salt bath furnace types in the world. When you discuss heat treating matters with Ajax, you get full benefit of unmatched experience not alone in designing and selling furnaces, but in helping you utilize them to best possible advantage.

There is no obligation in having Ajax make a frank appraisal of your heat treating situation.

## 952 Frankford Avenue Philadelphia 23, Pa.

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Internally heated.

Electric and gas fired types.

The most efficient heat treating principle for a wide variety of work . . . Pioneered by Ajax in the largest line of furnace types, shapes and sizes for modern production requirements.

#### PIONEERS IN SALT BATH HEAT TREATING PROGRESS

April 7, 1958



## Reduce "Manufacturing Overhead" ...by Going Overhead

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educe indirect mfg. costs
liminate re-handling
amage to floors eliminated
tilize larger production units
ontrol work flow
xpedite production

inimize employee fatigue

rull use of plant cubage

ain full use of floor space

ut "down time"
vercome floor hindrance
ecure flexibility in material movement
ransfer loads without re-handling
afety for the employee

An American MonoRail system will bring a quick reduction in manufacturing costs because it can do all the things listed at the left.

Overhead handling puts your ceiling space to work—leaves your floor free of traffic—helps you produce more efficiently in less space.

American MonoRail engineering consultants are available without obligation for the solution of your handling problems.

Write for Bulletin C-1 illustrating hundreds of successful MonoRail installations.



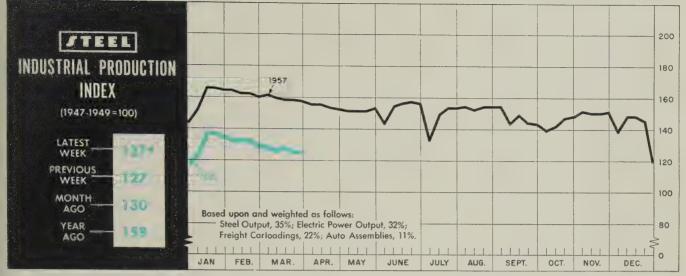
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MONORAIL

MEMBER OF MATERIAL HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION



\*Week ended Mar. 29.

## Purchasing Agents See End of Downtrend

THE NATION'S purchasing agents confirm a belief expressed in this column for several weeks: The recession is losing its downward momentum, but business will remain dull for some time.

Members participating in the monthly survey of the National Association of Purchasing Agents in late March stated that new orders maintained the improvement shown in February. Two-thirds of the respondents replied that orders were equal to or better than they were a month prior. Production shows signs of ending its downtrend, too. Only 30 per cent indicated a further slackening off, compared with 45 per cent in that category in February.

No. 1 Problem—Despite the more encouraging tone of business, the drive to liquidate inventories goes on; levels now approach those of mid-1954, NAPA reports. Members state that so long as materials are in free supply, they will pare stocks to the bone. Almost half the reporting agents have cut inventories in the past month; only 12 per cent have increased shelf purchases.

Business confidence remains high, as evidenced by the stability of plans for capital expenditures. Sixty-two per cent indicate that their budgets made up last fall are still intact, while only 29 per cent have made any cuts. Nine per cent have even

boosted their spending plans.

Metalworking's Mirror—In Cleveland, which often reflects conditions throughout metalworking, purchasing agents say conditions are a shade better than they were a month ago. Their report illustrates the uneven character of this recession. Some members of the Pur-

chasing Agents Association of Cleveland are still working five days a week. Others are on a short week. Inventory liquidation is going on at a faster pace than it is nationally. A hefty 93 per cent of reporting members held to prior levels or cut back more in March.

Parts Leveling-Producers of com-

BAROMETERS OF BUSINESS	LATEST	PRIOR	YEAR
	PERIOD*	WEEK	AGO
INDUSTRY  Steel Ingot Production (1000 net tons) <sup>2</sup> Electric Power Distributed (million kw-hr)  Bituminous Coal Output (1000 tons)  Crude Oil Production (daily avg—1000 bbl)  Construction Volume (ENR—millions)  Auto, Truck Output, U. S., Canada (Ward's)	1,298 <sup>1</sup> 11,750 <sup>1</sup> 7,445 <sup>1</sup> 6,250 <sup>1</sup> \$441.9 118,668 <sup>1</sup>	1,366 11,756 7,550 6,263 \$278.3 104,928	2,319 11,694 10,355 7,786 \$359.0 164,150
Freight Carloadings (1000 cars) Business Failures (Dun & Bradstreet) Currency in Circulation (millions) <sup>3</sup> Dept. Store Sales (changes from year ago) <sup>3</sup>	525 <sup>1</sup>	533	695
	357	336	318
	\$30,524	\$30,592	\$30,502
	4%	-1%	+1%
Bank Clearings (Dun & Bradstreet, millions) Federal Gross Debt (billions)	\$22,359	\$25,951	\$22,541
	\$273.0	\$275.4	\$272.0
	\$21.6	\$20.7	\$17.7
	10,856	11,316	8,549
	\$90.5	\$89.4	\$86.7
	\$28.3	\$28.0	\$26.0
PRICES  STEEL'S Finished Steel Price Index <sup>5</sup> STEEL'S Nonferrous Metal Price Index <sup>6</sup> All Commodities <sup>7</sup> Commodities Other than Farm & Foods <sup>7</sup>	239.15	239.15	227.41
	199.1	201.4	239.3
	119.8	119.6	117.0
	125.9	125.9	125.3

<sup>\*</sup>Dates on request. <sup>1</sup>Preliminary. <sup>2</sup>Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. <sup>3</sup>Federal Reserve Board. <sup>4</sup>Member banks, Federal Reserve System. <sup>5</sup>1935-39=100. <sup>3</sup>Bureau of Labor Statistics Index, 1947-49=100.

### **Design Analysis On Fasteners** and Small Parts

#### **Shows Cold Heading Usually Cuts Costs**

This may very well be the age of "Design Analysis". And, one of the most promising fields for such a cost saving study is fasteners and small parts. Actually one of the most important cost cutting developments in recent years is the increasing use of cold headed parts and fasteners in place of more expensive and structurally weaker screw machine products.

The more expensive bar stock used in the screw machine method results in considerable waste, whereas the waste is almost negligible in cold

heading.

Another important consideration is the greater strength structure of parts made by the cold heading method. The blow of the heading tool causes the grain structure of the metal to flow in lines of greater

strength.

The possibilities of cold heading are almost unlimited when used in conjunction with secondary operations. The tremendous savings in operation and material costs make it a must consideration when designing small parts either as fasteners or as integral units for manufactured parts. It has been a long time policy of John Hassall, Inc. to support their cold heading equipment with the latest methods of secondary manufacture. Machines for roll threading, slotting, drilling, tapping and many other operations are available for your profit.

Given complete specifications, including a drawing and an idea of the application, we can quickly tell you whether or not it will be advantageous to have your fastener or part JOB-DESIGNED by HASSALL. The remaining important aspect of our service to you is the ability to get into production quickly and make prompt shipment.

Write today for your copy of our new Catalog No. 106.

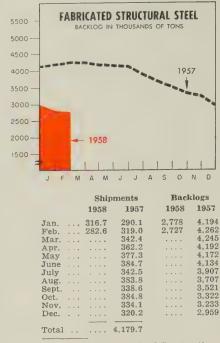
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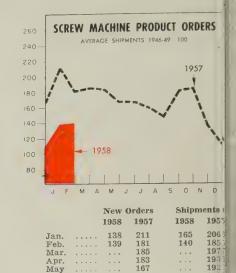
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#### THE BUSINESS TREND



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167 17 National Screw Machine Products Assa

167 166

159

147 181

184

June

Aug

Sept.

Nov.

192

184

144

ponents informed STEEL this week that their inventories are finally reaching the desired level (see Page 137) and that they see the end to this particular adjustment.

#### **Employment Firms Up**

One of the most significant results of the bottoming out is the improvement in employment although the Department of Commerce figures for March (due next week), may leave some doubt. Many observers feel that a great portion of the expected increase can be attributed to the last two weeks of February. Stability began to appear during the first half of last month. they argue.

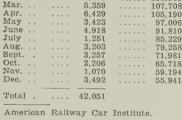
This was one of the most persistent patterns in the spot surveys of the component and capital goods industries conducted by STEEL last month. (See Mar. 24, p. 61, and Mar. 31, p. 47.) Those anticipating layoffs indicated they would be minor. Such reports were offset by renewed hiring or lengthening of workweeks.

The purchasing agents, in the reports mentioned above, feel that unemployment is leveling off. Cleveland group declares that the "trend toward less employment each month, for the last four months, has halted." The national association qualifies its conclusion by tying any future improvement to successful negotiation (without strikes) of the many important labor contracts that are up for renewal.

One of the weakest segments of the employment picture—automotive-appears to have found its level for a while at least. April production is scheduled to match that of Unless sales show more promise than they did in the first half of March, that level-a bit under 100,000 units a week-will prevail right on to model changeover in the fall-barring an autoworkers' strike in June.

James M. Dawson, vice president of the National City Bank of Cleveland, notes that the rate of increase in unemployment so far is similar to that of the 1949 and 1954 recessions. He concludes: "If the current recession continues along this course, the seasonally adjusted unemployment data will rise until June, level off for a few months and then begin to show some improvement in the closing months of the year." He puts the upper limit at 7 million in June when students enter the labor market.





# STANDARD VACUUM CLEANER SALES IN THOUSAND OF UNITS 450 400 350 250 200 150 1958

	1958	1957	1956
Jan	265,489	276,738	302,203
Feb	225,631	300,887	286,386
Mar		312,746	395,686
Apr		281,627	352,873
May		231,246	326,008
June		207,286	248,326
July		218,276	259,774
Aug		241,218	276,932
Sept		302,869	320,278
Oct		328,655	371,998
Nov		251,123	300,381
Dec		237,501	281,025
Totals		3,190,172	3,721,870

Vacuum Cleaners Mfrs.' Assn.

#### **Metalworking Prices Hold**

About the only definite uptrend is the cost of living, and it is becoming increasingly clear that metalworking is not responsible for the climb. The all-commodities group forged 0.8 per cent ahead of the February level by the end of March (see Barometers of Business, Page 79). Practically all the extra weight comes from farm products, processed foods, and meats. The "all other" group barely edged above the February level.

In fact, the NAPA survey indicates that there is some softness in industrial prices. List prices have not changed much, but they are being discounted more frequently.

#### **Appliance Industry Uneven**

In the appliance and household goods industry, you have to appraise business company by company because of the mixed pattern. Fred Maytag II, president of Maytag Co., believes his company's sales may have equaled those of the year-ago period during first quarter. At the same time, he believes the industry lagged by more than 20 per cent. Elisha Gray II, president of Whirlpool Corp., opines that he wouldn't

be surprised to see 1958 end up 10 per cent behind 1957 in appliance sales because of the slow start. But his company is still in the black for the first quarter.

At Frigidaire Div. of General Motors Corp., 1100 production workers and some salaried employees were furloughed last week. Westinghouse Electric Corp. is closing down its Columbus, Ohio, appliance plant this week idling 4000 workers. But at Louisville, General Electric Co. recalled 3800 employees to the refrigerator plant and furloughed 1900 at the home laundry equipment plant.

At their convention in late March, members of the Gas Appliance Manufacturers Association gave glowing reports of their efforts to combat the slowdown in consumers' interest in hard goods. Producers are counting on a fillip from the homebuilding industry this year. Equally important is the enthusiasm home owners are showing for modernization. Among those commodity groups reported ahead of the 1957 pace or headed in that direction are: Central heating units, water heaters, direct heating equipment, unit and commercial heating equipment, incinerators, and automatic controls.

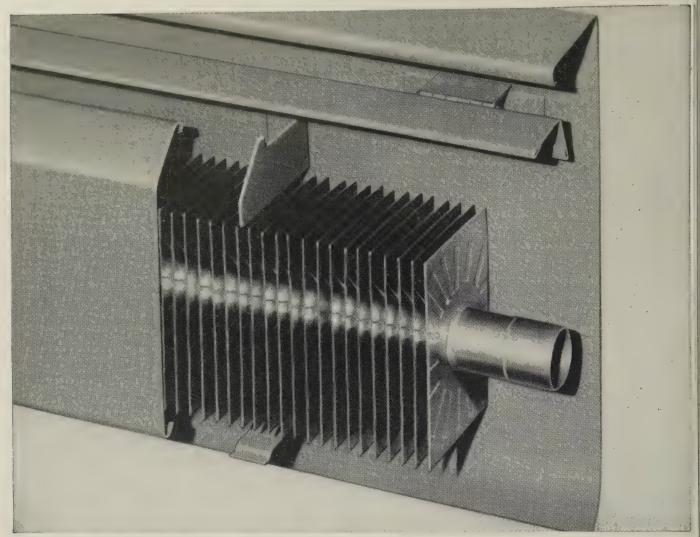


- **ALWAYS READY** to use . . . no fuel or other "operating supplies" needed.
- 2 NO "STARTING" Problems ... regardless of cold, heat, rain or dust.
- 3 NO "HOUSING" Problems...no protective warehousing needed, no covering, no "babying".
- 4 NO MAINTENANCE Problems... nothing to get out of order ... rugged, long-lasting.
- 5 EASIEST WHEELING ... with choice of pneumatic, semi-pneumatic or steel-tired wheels (plain, ball or roller bearings.) These are the easiest rolling wheelbarrows made!
- **6 EASIEST** on the barrow man... engineered to balance 4/5th of load on the wheel; only 1/5th of load at handle grips.
- **7** EASIEST, CLEANEST DUMPING... Sterlings have steel trays engineered to unload completely, with least effort.
- 8 COST LESS PER YEAR . . . . Sterlings pay off in profits. Their unusually long service life protects your initial investment. And maintenance costs are nil.

STERLING WHEELBARROW CO.
MILWAUKEE 14, WISCONSIN, U. S. A.



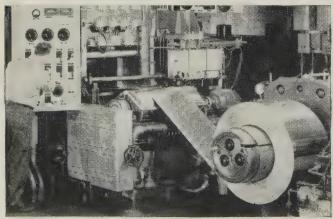
A7-4513-1/3



A section of Rittling 750 baseboard radiation. Rittling uses Anaconda Aluminum Alloy 3003-H14, .025 gage in 4" and 4%" widths for fins.

## "From past experience, we know we can count on Anaconda for quality Aluminum Coiled Sheet."

The Rittling Corp., Buffalo, N. Y., manufacturer of baseboard and fin tube radiation for commercial, residential, and institutional applications has used Anaconda Copper Tube in their units for many years. Now they are using Anaconda Aluminum Coiled Sheet for the fins. "We can



Available for prompt shipment to all points in the U.S. Anaconda Aluminum Coiled Sheet in gages from 0.006" to 0.064" and in widths from %6" to 28"; coils up to 100 pounds per inch of width, in alloys: 1100, 3003, 3004, 5005, 5050, 5052.

always count on The American Brass Company for a quality product," says Mr. Dan Moran, purchasing agent.

Rittling stamps the fins from large coils of aluminum sheet. Copper tubes are expanded into flanged holes in the fins to provide a tight, large-area contact for efficient heat transfer.

ALUMINUM COILED SHEET produced to the high standards of quality and uniformity maintained by The American Brass Company is now available for prompt shipment from our Torrington Division to all points in the United States.

It is rolled on the most modern, high-speed equipment, X-ray controlled to close tolerance in gage. High-speed, electronically operated slitters give exact widths with clean edges on evenly and tightly wound coils. Latest type annealing furnaces—with controlled atmosphere and temperature—provide high uniformity of metal structure to meet specified mechanical-property limits.

FOR IMMEDIATE ACTION, contact The American Brass Company's District Sales Office nearest you or The American Brass Company, Torrington Division, Torrington, Conn.

5798 Rev.





FRED A. KAUFMAN
Universal-Cyclops v. p.



A. T. STEWART Veet sales manager



C. BEACH POWELL joins Cleveland Cap Screw



H. W. WHITMAN
Torrington Mfg. v. p.

Fred A. Kaufman was elected a vice president of Universal-Cyclops Steel Corp., and general manager of its newly organized Refractomet Div. at Bridgeville, Pa., formed to advance the company's participation in commercial development of refractory and reactive metals.

A. T. Stewart was made national sales manager, Veet radial drill, Veet Industries, Detroit. He leaves Burns & Roe of Michigan Inc., where he served as vice president and general manager since 1957. He formerly was assistant to the president of Palmer-Bee Corp., and prior to 1954 served as director of purchases for Amgears and Huppower Div. of Hupp Corp.

Robert A. Olen was elected vice chairman of Four Wheel Drive Auto Co., Clintonville, Wis. He is succeeded as president by Maurice E. Ash, formerly vice president of Paradynamics Inc., St. Louis. Paradynamics purchased control of Four Wheel Drive in January.

Philadelphia Steel & Wire Corp., Philadelphia, elected Ezra Garforth Jr. vice president-sales, steel mill division; Elmo C. Mincher, vice president-sales, spring washer division.

Howard A. Halvorson was appointed general sales manager, Gardner Mfg. Co., Horicon, Wis. He was with A. J. Lindemann & Hoverson Co.

E. A. Lindemann, former president of A. J. Lindemann & Hoverson Co., was elected first vice president of Ampco Metal Inc., Milwaukee.

C. Beach Powell joined Cleveland Cap Screw Co., Cleveland, as sales manager, socket division. He was assistant general sales manager of Hartford Machine Screw Co., division of Standard Screw Co.

Martin C. Butters was named executive vice president, Brubaker Tool Corp., Millersburg, Pa. He will also direct operations of the Morton Machine Works, a subsidiary. George N. Fairchilds was made vice president-sales; Jesse W. Elliott, vice president-manufacturing.

Albert T. Both, since 1953 works manager of the Cleveland Mill Div. of Chase Brass & Copper Co., subsidiary of Kennecott Copper Corp., was appointed assistant vice president-operations. He is succeeded by Howard C. Walters, former assistant works manager.

Phillip Hall was made manager of industrial sales, A. Schrader's Son Div., Scovill Mfg. Co. Inc., Brooklyn, N. Y. He was assistant manager, industrial division.

James F. McCartney was appointed assistant to the president of O. Hommel Co., Pittsburgh. He was vice president-general sales manager, Duff-Norton Co.

Frank Jenks, president of International Harvester Co., Chicago, will become chief executive officer in May when John L. McCaffrey, chairman and chief executive officer, retires. Mr. McCaffrey will continue as a director and member of the executive committee. The office of chairman will not be filled.

H. W. Whitman was elected vice president and general manager, machine division, Torrington Mfg. Co., Torrington, Conn. He was general manager of the division.

Kenneth T. Carolan was elected vice president of Carmer Industries Inc., Kenilworth, N. J. Gordon Britt was appointed sales manager. Mr. Carolan continues as general manager, supervising production of Kel-F, Nylon and Teflon rods, tubes and sheets.

George H. Abendroth succeeds E. J. Tiefenthaler, retired, as president of Worden-Allen Co., Milwaukee. Emil Abendroth, vice president, assumes additional duties as sales manager. He relinquishes the post of chief engineer.

American Baler Co., Bellevue, Ohio, appointed Frank Hofstatter chief engineer in charge of baler design and research. He also will work on special machines and attachments. Mr. Hofstatter previously was with Euclid Div., General Motors Corp.

Jeffrey Mfg. Co. named Robert J. Brady manager of the Chicago district office to replace James Green, resigned. William A. Lewis replaces Mr. Brady as district manager in Jacksonville, Fla. Robert D. Prushing was made manager of distributor sales department at the home office in Columbus, Ohio.

Karl C. Wizeman was appointed product manager, metal packing line, Garlock Packing Co., Palmyra, N. Y. He is responsible for marketing of all metal packings. He



E. ALLEN HOLBROOK
Kaiser Aluminum marketing post



CHARLES M. BEEGHLY

J&L executive v. p.



ROBERT W. GRADY
Hartford Machine sales post



JOHN J. BUCKLEY
J. Bishop & Co. v. p.

has been staff superintendent, metal division.

E. Allen Holbrook was named marketing manager for extrusion products, Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif. W. H. Grimm was made product manager of extrusions at the general sales offices in Chicago. Mr. Holbrook joined Kaiser Aluminum a year ago as manager of the order allotment division. Prior to that he had been with Pittsburgh Screw & Bolt Corp. and with United States Steel Corp. Mr. Grimm formerly was assistant product manager, extrusions.

Alfred W. Smiley was elected treasurer of Latrobe Steel Co., Latrobe, Pa. H. S. Saxman was appointed vice president-finance, continuing as secretary.

Leslie M. Nelson was appointed sales engineer, Cleveland Instrument Co., Cleveland. He was sales engineer in the industrial equipment department of Brush Electronics Co.

Engineering promotions for General Electric Co.'s transistor department at Syracuse, N. Y., include: Sydney O. Johnson, named manager of transistor advance and design engineering; Martin E. Clark, named manager of transistor product engineering.

E. A. Siebert was named executive vice president, F. B. Redington Co., Bellwood, Ill.

Allis-Chalmers Mfg. Co. named A. P. Bowman manager of the Milwaukee district office; James Onarheim to the new post of manager of utility sales, Milwaukee district.

Charles M. Beeghly was elected executive vice president of Jones & Laughlin Steel Corp., Pittsburgh. He was president of J&L's strip steel division, formed in August, 1957, when J&L purchased Cold Metal Products Co., Youngstown. Martin K. Schnurr was appointed president, strip steel division, in addition to his present duties as president of the stainless steel division, also formed in 1957 on acquisition of Rotary Electric Steel Co., Detroit.

Robert W. Grady was made standard products sales manager, Hartford Machine Screw Co., Hartford, Conn., division of Standard Screw Co. He was sales manager, Hanson Whitney Div., Whitney Chain Co.

David Laub was made New York district manager, Steelcraft Mfg. Co.

Hamilton Mfg. Corp., Columbus, Ind., elected as vice presidents: Robert L. Wendling, vice president-purchasing; Frank Zeigler, vice president-production; Thomas R. Henderson, vice president-sales.

John J. Buckley was elected vice president of J. Bishop & Co. Platinum Works, Malvern, Pa., in charge of all company divisions. In addition, he continues as general operations manager of company plants.

Edward N. Hibbert was appointed assistant general superintendent of U. S. Steel Corp.'s Clairton, Pa., Works, succeeding Frederick A. Dudderar, now general superintendent. Mr. Hibbert formerly was division superintendent, slabbing and plate mills, Homestead, Pa., district works.

Lawrence F. Black was named manager of Utah operations for U. S. Steel Corp.'s Columbia-Geneva Steel Div., and manager of operations of Columbia Iron Mining Co. He is succeeded as general superintendent of the steel division's Geneva, Utah, works by A. E. Terry. Carl J. Forkum succeeds Mr. Terry as assistant general superintendent.

Robert M. Bowen was made dealer



ROBERT L. WENDLING



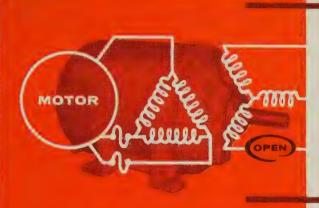
FRANK ZEIGLER



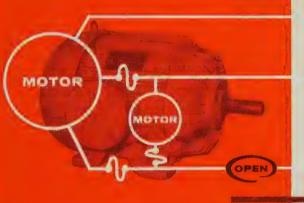
THOMAS R. HENDERSON

Hamilton Mfg. vice presidents

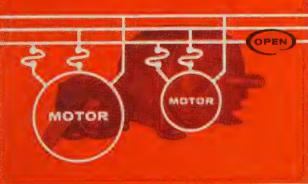
# Three-Coil Overload Protection Would Have Prevented These Motor Burn-outs



MOTOR No. 1. Even though this three-phase motor was equipped with a 2-coil overload relay, the motor burned out ... and here's why. Like the vast majority of three-phase motors in use today, this motor took its power from a wyedelta transformer; and an open phase condition in the transformer primary caused one high and two low motor currents. The 2-coil overload relay could not save this motor because the high current was in the unprotected line. Why gamble with a motor burn-out? Insist upon 3-coil overload relays for all your three-phase motors... the only dependable overload protection for all open phase conditions.

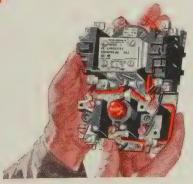


**MOTOR No. 2.** This three-phase motor was operating at 70% full load with a 40% loaded single phase motor connected in parallel when one of the incoming power lines opened. Once again the 2-coil overload relay failed to detect any trouble. However the motor current in the winding without a thermal element rose to 152% full load current, while the current in the phases with the 2-element relay did not reach tripping value. This caused permanent damage to the motor winding. This motor could have been saved with full three-phase overload protection. Be sure your three-phase motors are completely protected from the hazards of all open phase conditions with dependable 3-coil overload relays.



MOTOR No. 3. This 1 Hp, three-phase motor was working in parallel with a 10 Hp, three-phase motor when one of the incoming power lines opened. While the 10 Hp motor was not adversely affected by this circuit unbalance, the motor current in one line of the 1 Hp motor reached 140% full load current resulting in a burned out winding. As in the other examples, the 1 Hp motor's 2-coil overload relay proved ineffective because the overload occurred in the one line left unprotected. Don't let this happen to your motors. Insist upon 3-coil overload relays for every three-phase motor, large or small...only 3-coil overload relays provide dependable open phase protection under all operating conditions.

Cutler-Hammer Three-Star Motor Control offers 3-coil overload relays in all standard starter constructions and enclosures. For immediate delivery see your nearby Authorized Cutler-Hammer Distributor. Machine designers and panel-builders, open type Cutler-Hammer Three-Star Motor Control with 3-coil overload relays require no more space than starters with only 2-coil overload relays. CUTLER-HAMMER Inc., 1211 St. Paul Ave., Milwaukee 1, Wis., Associate: Canadian Cutler-Hammer, Ltd., Toronto.







JOHN J. HANNIGAN Alan Wood Steel supt.



JOHN P. ZUR Sunbeam div. chief eng.



HERBERT A. BOAS JR. marketing dir. at Budd



PHIL CLARKE Lone Star Steel post



PAUL E. BERNDT Harvill Corp. v. p.



O. P. CARTER Midwest Piping president

sales manager of Ditto Inc., Chicago.

Phil Clarke was named manager of hot-rolled steel products for Lone Star Steel Co., Dallas. He joins Lone Star after eight years in steel sales with Youngstown Sheet & Tube Co.

Gordon J. Wygant was appointed aviation sales manager of Titeflex Inc., Springfield, Mass., subsidiary of Atlas Corp.

J. Warren Gillon was appointed manager of customer relations, Electronic Instrumentation Co., Denver, division of Ramo-Wooldridge Corp. He was manager, atomic equipment department, American Radiator & Standard Sanitary Corp.

Wallace F. Meyer succeeds Byron Erwin, retired, as resident manager of sales, Minneapolis district, Jones & Laughlin Steel Corp.

Ralph J. Canard was named vice president-general manager, B & H Engineering Corp., Whittier, Calif.

Paul E. Berndt was appointed vice president-engineering and manufacturing, Harvill Corp., Los Angeles. He resigned as sales manager of Castmaster Inc., Cleveland. Mr. Berndt was previously plant manager of Harvill from 1948 to 1950.

O. P. Carter was elected president of Midwest Piping Co. Inc., St. Louis. He was executive vice president. Mr. Carter succeeds the late Eric A. Kerbey.

L. T. DeLaup was made assistant to the president of Armco Steel Corp.'s subsidiary, Southwest Steel Products, Houston. He is succeeded as district sales manager, Sheffield Div., Houston, by P. T. Babb.

Don F. Pankoff was made assistant superintendent of the Elyria, Ohio, plant, steel and tubes division, Republic Steel Corp.

Wesley A. Carr was named director of engineering at Traywell Corp., San Diego, Calif.

John J. Hannigan was appointed superintendent, open hearth department, Alan Wood Steel Co., Conshohocken, Pa. He was assistant open hearth superintendent.

John P. Zur was promoted from chief engineer-nonferrous metals and wire, to chief engineer of the industrial furnace division, Sunbeam Corp., Chicago. Prior to joining Sunbeam in 1956, he was vice president of Trauwood Engineering Co., and production manager for Lee Wilson Contracting Co.

Herbert A. Boas Jr. was appointed director of marketing, Budd Co., Philadelphia.

#### OBITUARIES...

Roy H. Glover, 67, chairman of the board of Anaconda Co., New York, died in Washington Mar. 31.

Charles C. Chambers, 69, president and general manager, Texas Foundries Inc., Lufkin, Tex., died Mar. 26.

Harrold L. Gobeille, 63, vice president-marine department, Cleveland-Cliffs Iron Co., Cleveland, died Mar. 31.

John W. Fisher, 49, assistant purchasing agent, Anaconda Wire & Cable Co., New York, died Mar. 24.

Austin L. Hawk, 47, manager, central sales region, Manhattan Rubber Div., Raybestos - Manhattan Inc., died in Cleveland Mar. 21.

Charles L. Chubbuck, 70, senior vice president, R. C. Mahon Co., Detroit, died Mar. 23.

Robert J. Sullivan, 53, manager of the forging division of Brewer-Titchener Corp., Cortland, N. Y., died Mar. 18.

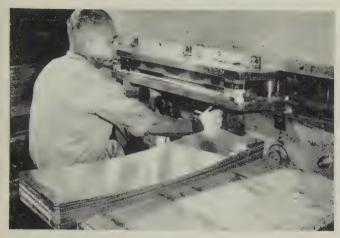
Harold C. Hansen, 68, a founder and vice president, Modern Machine Works Inc., Milwaukee, died Mar. 12.

John Y. Levene, president, Levene's Son Inc., Binghamton, N. Y., died Mar. 16.

Robert C. Moest, 49, purchasing agent, McCauley Metal Products Corp., Buffalo, died Mar. 15.

#### **Production Takes A Short-Cut**

#### With Pre-Plated NICKELOID METALS



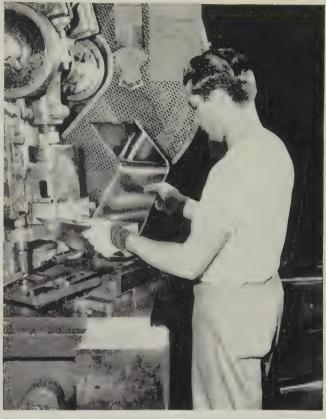
Sheet of Nickeloid chrome-steel that will be used for breadbox is blanked, with punch-out perforations for ventilation and indented shelf supports. Uniform pre-plated finish reduces rejects.



Edges of Nickeloid chrome-steel sheet are turned up 1/2" in forming press. Nickeloid is easily worked with standard methods.



Breadbox body frame is spot welded to the preformed bottom and back pieces, with no visible oxidation. Parts then move to assembly.



Two bends are made on press to give the breadbox its rectangular shape. Operation causes no marring of surface or dulling of finish.

#### No Cleaning or Post-Plating — Easily Worked With Standard Production Methods

No cleaning solutions, plating tanks or polishing wheels on the production line at Lincoln Metal Products Co., Brooklyn, N.Y., manufacturer of fine pantryware. Lincoln eliminates these costly intermediate steps by using Nickeloid preplated chrome-steel and copper-steel. These versatile design materials speed trouble-free production, reduce rejects, prolong tool life. They are readily worked with standard production methods, as shown here. Parts move from fabrication—to assembly—to packing, with no dulling or marring of the pre-plated finish, since Mar-Not protective covering is used. No cleaning, plating, polishing is needed. Nickeloid Metals are available in pre-plated finishes of chrome, nickel, copper or brass on steel, zinc, copper, brass and aluminum. Sheets, strips, coils—a wide range of finishes and patterns.

AT THE DESIGN ENGINEERING SHOW SEE NICKELOID METALS, BOOTH 103-A



AMERICAN NICKELOID COMPANY

Peru I, Illinois



## Taking a non-stop hop... over a bumper-to-bumper crop!

Highway or aisleway, there's often congestion below. So why depend on meandering, slowpoke traffic to move materials from one point to another in your plant. Materials should go "easy"—up 'n' over via Trambeam Overhead Handling Systems. Above congestion. Up where it's clean, uncluttered. Where it's fast, safe. Where time is gained and production takes wings. Where only costs are down to

earth! Look into Trambeam Overhead Handling Systems. Find out details on the two basic types—crane and monorail. See how they're serving all industry...how they can serve you. Send for Whiting Bulletin M-20... twenty pages of interesting plain-talk about the "up-to-date" way to move your materials. Address your inquiry to Whiting Corporation, 15643 Lathrop Ave., Harvey, Ill.





MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT

## Convair Builds Wind Tunnel

It uses 1150 tons of steel. An intermittent type with an 8000-hp motor, it is designed for speeds from Mach 0.5 to Mach 5. Chicago Bridge is the prime contractor

NEARLY 1150 tons of steel were used in constructing a 3700-mph wind tunnel at Convair Div., General Dynamics Corp., San Diego, Calif. Included were 120 10-in. Hbeam piles, each driven 70 ft into the ground for circuit and building foundation.

Biggest single item in the tunnel is the 97-ton settling chamber where air rushes just before going through the nozzle. The nozzle section (which used 250 tons of steel plates, weldments, hydraulic jacks, and electric drive motors) was assembled to an accuracy of 0.0001 in. to permit positioning of the flexible plates forming the nozzle contour.

An intermittent, blow-down type, the tunnel is designed to simulate speeds from Mach 0.5 to Mach 5 for research on planes and missiles. The test section measures 4 ft x 4 ft. With its 8000-hp motor, it has the same capacity as a continuous-flow tunnel with 150,000 hp.

Principle—The intermittent type wind tunnel uses a comparatively low power system to store energy for long periods for discharge in short bursts at a much higher energy level. Runs at Convair will rarely exceed 2 minutes (average: 30 seconds).

It will use enough electric power to support a town of 1400 persons and enough water in 1 hour to provide service for 14 average homes for a month.

Frigid—Temperatures in the tunnel will drop as low as  $7^{\circ}$  F (expanding air cools rapidly). Air in the tanks, shortly after a run, will drop to  $-100^{\circ}$  F.

Because of this, each tank contains a bed of alumina balls as a thermal mass for temperature stabilization. To maintain more precise control in the operating range, a bypass system takes air between the second and third compression stages, routes it through a heat ex-

changer and sends it to the storage tanks at specified temperatures.

Noise—Wave-shaped baffles and a network of steel girders will suppress the noise of sonic booms created inside the tunnel.

Prime contractor was Chicago Bridge & Iron Co., Chicago. Cost: \$3.5 million.

#### Tank Within a Tank

Cambridge Corp., Lowell, Mass., delivered a large airborne doublewall tank to the Air Force at Hanscom Air Base, Bedford, Mass. The outer shell is aluminum; the inner tank is stainless steel. It will be used for fueling the Thor ballistic missile. More than 50 ft long and 8 ft in diameter, it is designed to hold 13,500 gallons of liquid oxygen at -297.4° F. Aluminum fabrication techniques were developed to make the tanks light enough for air shipment yet strong enough to support 170,000 lb of liquid oxygen when full.

#### **Foundries To Make Studies**

Chance Vought Aircraft Inc., Dallas, contracted with three foundries to conduct research on three methods of casting high strength steel parts for supersonic aircraft. Contracts (about \$250,000 each) were awarded to Stanley Foundries, Los Angeles; Mercast Corp., La Verne, Calif.; and Pacific Alloys, San Diego, Calif. Vought holds an Air Force contract for the project. Each company will work on a different configuration casting.

#### **Titeflex Gets Contract**

Titeflex Inc., Springfield, Mass., was awarded a contract by the Air Force for production of components for a radio shielded ignition harness. It was designed by Titeflex for the Air Force and is used on the Pratt

(Please turn to Page 92)



- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- ◆ HEAT-TREATED, CASE OR FLAME=HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heattreated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality...same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

rial V-belts.

SPUR GEARS •

BEVEL GEARS . MITRE GEARS

WORMS • WORM GEARS



## FIRST BASIC OXYGEN FURNACES

# at Jones & Laughlin use Research-Cottrell Precipitators

Industry's toughest gas cleaning problem. That's how they refer to the job of removing dust from basic oxygen furnace gases. Briefly, here's what's involved:

34 pounds of dust for each ton of blast furnace hot metal. 90% of this dust is less than 1 micron. Dust concentration is about 11 grains per cubic foot. Over 98% guaranteed collection efficiency.

The Research-Cottrell precipitators at Jones & Laughlin Steel Corporation's Aliquippa, Pa., plant are designed to process from 250,000 cfm to 400,000 cfm of the above gases at conditions developing a

collection efficiency of 98%.

The diagram and text on the next page explain briefly how Research-Cottrell precipitators fit into the basic oxygen steel making process. If you would like more information on how to insure high dust collection efficiencies—at a low cost—get in touch with your nearest Research-Cottrell representative. Whether your problem involves iron blast furnace, ferro manganese blast furnace, open hearth, sintering or other steel industry applications, you can count on an economical solution to your problems at Research-Cottrell.

## Research-Cottrell

RESEARCH-COTTRELL, INC. Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y.

• Grant Building, Pittsburgh 19, Pa. • 228 N. La Salle St., Chicago 1, III. • 58 Sutter Street, San Francisco 4, Calif.

• Research-Cottrell (Canada) Ltd., 33 Bloor Street East, Toronto 5. Ontario.

#### How Research-Cottrell Gets over 98% Collection Efficiency

First, the gases generated at the furnace are burned with excess air and cooled in a water-jacketed hood and chamber with water sprays. The water spray header acts as a baffle for the gas, causing the larger particles to fall into the "spark box" and from there to a settling tank.

The gas is further cooled by radiation in the flue connecting the spray chamber to the "gas inlet." The purpose of the "gas inlet" section is to decrease the gas flow, allowing still more of the large particles to drop into the "expansion chamber" before entering the precipitator.

In order to achieve such high collection efficiencies, collecting plates must be kept clean. This means that rapping is a highly critical factor in the overall efficiency. Both MI Rappers used for collecting electrodes and the high tension syntron vibrators are operated continuously and automatically. They can be varied in cycle and intensity of rapping time to maintain high efficiencies under changing conditions.

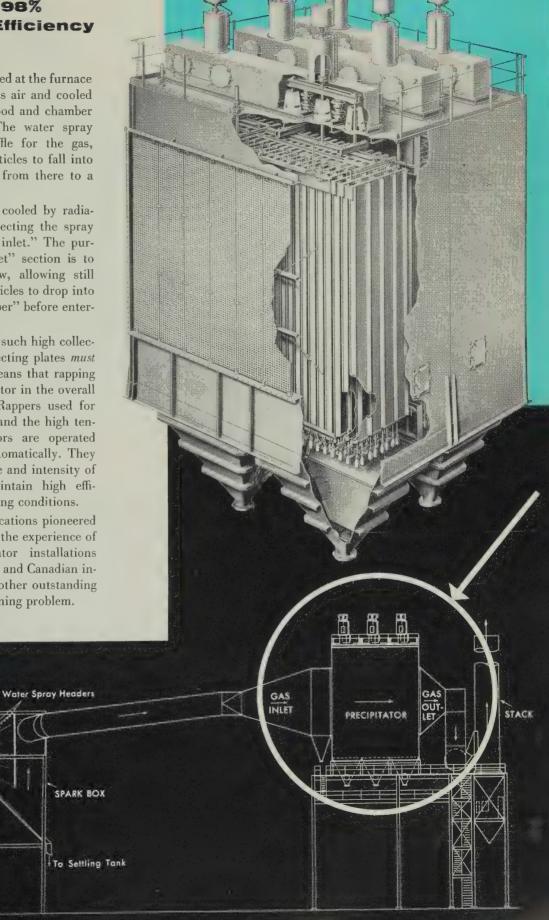
As in all new applications pioneered by Research-Cottrell, the experience of over 2000 precipitator installations throughout American and Canadian industry resulted in another outstanding solution to a gas cleaning problem.

Water Jacketed

Spray Chamber

HOOD

FURNACE



## Ask Standard

how to
cut costs with
conveyors



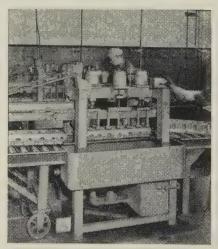
Cylinder blocks are chipped, ground and inspected on Standard Roller Conveyor line.

## Eastern foundry simplifies cylinder block handling with roller conveyors

HERE'S another installation in which Standard Roller Conveyors are keeping heavy, bulky components flowing to machining and assembly points with minimum manpower and practically no time loss.

Easy to set up and exceptionally sturdy, Standard Roller Conveyors (live or gravity) can also be job-tailored to your specific materials handling problem — permanent or temporary.

And roller conveyors are only one of the many types of Standard conveyors. Others include belt, slat, chain, pushbar or sectional conveyors as well as spiral chute systems.



Standard Roller Conveyors are available from stock in a wide range of roller diameters, centers and frames.

Call the Standard engineer listed in your classified phone book or write direct for Bulletin 68—Address Dept. Y-4.

Why not take advantage of Standard's half-century of conveyor application experience. Consult STANDARD CONVEYOR COMPANY. General offices: North St. Paul 9, Minnesota. Sales and service in principal cities.



(Concluded from Page 89) & Whitney R4360 engine. A subsidiary of Atlas Corp., Titeflex designs and produces flexible hose and other aircraft and industrial products

#### Big Ball Mill Shipped

Allis-Chalmers Mfg. Co., Milwaukee, shipped to a midwestern cement plant one of the biggest single compartment ball mills ever built in the U. S. Measuring 13 ft by 20 ft, it had to be shipped in two sections and reassembled at the erection site.

#### **Operations Transferred**

Roller-Smith Corp., Scranton, Pa., which was acquired last year by Federal-Pacific Electric Co., will suspend operations at its Bethlehem Pa., plant. The shutdown will idle 300 employees. Roller-Smith's circuit breaker production will be transferred to Scranton.

#### **Shipyard May Come to Life**

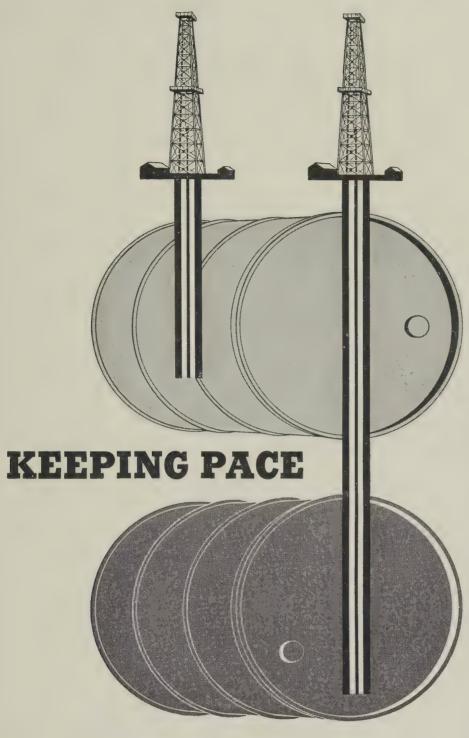
Wagner Iron Works, Milwaukee, bought the Froemming Bros. ship-yard in 1945 but never used it for shipbuilding. The company is now seeking Navy ship contracts. A. J. Werner, president, says the St. Lawrence Seaway and plans for increased naval shipbuilding prompted a policy change.

#### To Build Naval Boilers

Babcock & Wilcox Co.'s Cleveland office received a \$2 million contract from Defoe Shipbuilding Co. to build eight boilers for Navy destroyers that will carry guided missiles. B&W officials say the contract duplicates one received last year. They credit the St. Lawrence Seaway with increasing importance of shipyards on the Great Lakes.

#### **RCA Sets Up New Division**

Radio Corp. of America has established a Semiconductor & Materials Div. It is responsible for engineering, manufacturing, and marketing of semiconductors and materials and basic components fabricated from them. General man-



Drills were chewing their way down for about 2000 feet in the search for oil in 1916. Today's drilling depth is more than double that.

The change in drilling that forty years has brought well symbolizes many advances in the petroleum and chemical industries. Engineers have dug more deeply into the secrets of nature, too... have designed plants and processes to wrest new products and services from petroleum, ores and elements.

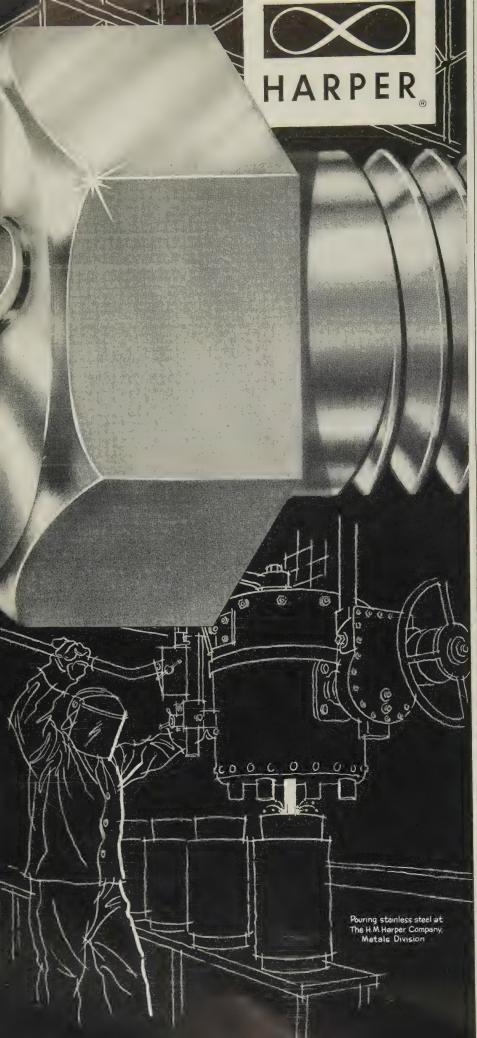
We mentioned 1916 because that is the year Sun Ship was founded. It has long served the swift-growing needs of petroleum and chemical industries. Year by year, the engineering skill and facilities of the great Sun Ship plant have proven their ability to meet the demands for plant and equipment keyed to the swift pace of progress in these and other important fields. Sun Ship keeps pace with progress.

SHIPBUILDING

& DRY DOCK

COMPANY

ON THE DELAWARE . CHESTER, PA.



ager is Dr. Alan M. Glover. Head-quarters will be at Somerville, N. J.

#### Installs Control System

C & D Batteries Inc., Conshohocken, Pa., installed a new Accu-Ray system for automatic control of the plate-pasting operation in making industrial storage batteries. It will measure and control the amount of lead oxides that go into each battery plate.

#### J&L Has New Division

Jones & Laughlin Steel Co.'s Strip Steel Div., Youngstown, will market a new electrolytic copper coated strip. Steel for the strip is produced by J&L's new basic oxygen furnaces at Aliquippa, Pa. Annealing and heat treating will be done at Youngstown.

#### **Builds Processing System**

Systems Div., Beckman Instruments Inc., Anaheim, Calif., will build an electronic computer data processing system for Continental Oil Co. It is designed to sustain peak operational efficiency in a catalytic reformer at Ponca City, Okla., producing 10,000 barrels per day of high-octane gasoline.

#### Aluminum Work Boat in Use

A 42-ft welded all-aluminum work boat (beam, 9 ft) has been placed in service by Albert Bernert, tugboat operator, on the Willamette River in Oregon. It was built by Nichols Boat Works Co., Hood River, Oreg.



#### CONSOLIDATIONS

Basic Products Corp., Milwaukee, will purchase Sola Electric Co. through an exchange of \$4.6 million worth of common and preferred stock.

Stubnitz-Greene Spring Corp., Adrian, Mich., purchased Flannery Mfg. Co., Pittsburgh. Both firms produce cushioned seat springs for automobiles.

Borg-Warner Corp. acquired Precision Engineering & Gear Co., Hialeah, Fla., as a branch of its Pesco Products Div., Bedford, Ohio. Edmund W. Guyer, president of Precision, will remain as general manager of the new branch.

Cutler-Hammer Inc. will purchase business and assets of Airborne Instruments Laboratory Inc., Mineola, N. Y., electronics firm, through an exchange of stock. The acquisition will involve nearly \$8 million worth of Cutler-Hammer stock. Airborne will be operated as a division of the Milwaukee firm.

Controls Co. of America, Schiller Park, Ill., purchased from Breese Burners Inc., Santa Fe, N. Mex., assets consisting of laboratory equipment, materials, designs, products, plus U. S., Canadian, and foreign patents. Breese specializes in design and development of vaporizing oil burning devices.



Island Creek Coal Co. will build a coal carbonization research laboratory adjoining its quality control lab at Holden, W. Va. The new laboratory is expected to begin operations this year.

Illinois Gear & Machine Co., Chicago, completed a new plant at its South Works. Principal feature of the expansion is a heavy machinery building, 300 ft long and 80 ft wide with railroad track through the center. The building also has a double crane with a lifting capacity exceeding 50 tons.

Westinghouse Electric Corp. opened a new plant near Youngwood, Pa., for production of semiconductor devices, primarily for power applications.

Western Electric Co. opened a new \$5 million supply plant at Los Angeles. The firm has 32 such plants.

Shafer Bearing Div., Chain Belt Co., opened a new plant at Downers Grove, Ill. It has isolated heat treating and plating departments, a (Please turn to Page 98)



## usership...

## what happens after

The power, the excitement, the force that enables a magazine to move readers to action is wrapped up in this one word. STEEL has this power, because STEEL attracts readership of the men who are leading metalworking's progress. They depend on STEEL. They use STEEL. They read. Then they act.

Example: Brainstorming, introduced to metalworking in a STEEL article, is now used by forward thinking companies throughout the industry.

When STEEL arrives in a plant, there's action. That is why more advertisers to metalworking are placing more advertising in STEEL than in any other magazine.

usership is the strength of TIELL



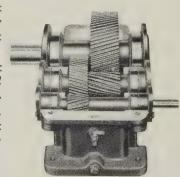


Here's a job that calls for rugged power and dependable gearing — pulling fourteen 75-ton railroad cars along a straight track, up a 1% grade, at a speed of 40 ft. per minute.

Webster Manufacturing, Inc., Tiffin, Ohio, easily solved this problem with the construction of a 50 HP Webster Car Mover. As part of this unit, Webster selected a Horsburgh & Scott Helical Gear Speed Reducer because it provided the necessary stamina for this high-torque job . . . unusually heavy bearings to withstand the greater overhung loads incident to car-puller operation.

From the same source — Horsburgh & Scott — Webster obtains the necessary extra heavy machine cut spur gears that drive the cable drum.

Seventy years of experience prove that rugged construction and ample overload capacity of H & S products assure trouble-free service and operating economy. Send us your requirements or contact your nearby H & S representative for prompt recommendations.



THE HORSBURGH & SCOTT

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue Cleveland 14, Ohio (Concluded from Page 95)

centralized cooling system for grinding machines, and an atmosphere controlled assembly area.

General Electric Co. will build a new plant near Phoenix, Ariz., for its Computer Div. Work will begin in May.

Calumet & Hecla of Canada Ltd. opened its new Wolverine Tube plant (cost: \$7 million) in North London, Ont. It will produce nonferrous seamless tubing.

Youngstown Sheet & Tube Co. will build a new sintering plant at its Indiana Harbor Works, East Chicago, Ind. It is scheduled for completion next spring. Capacity: 4200 tons of sinter products daily.

Hill-Chase Steel Co., Baltimore, completed a 4000 sq ft addition to be used for storage.

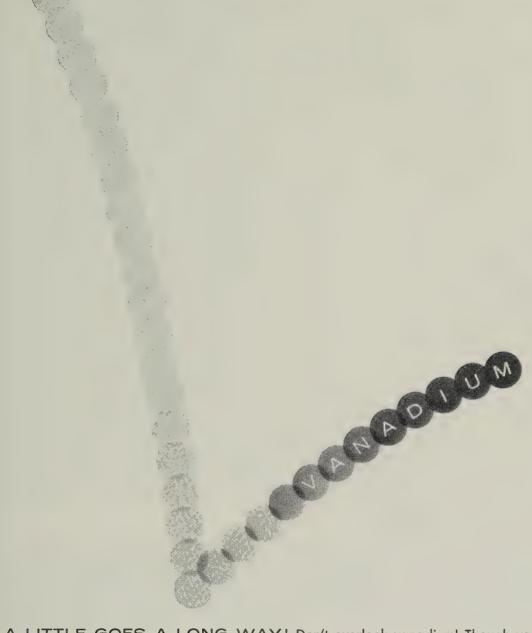
Joseph Behr & Sons Inc., Rockford, Ill., opened a new building for scrap metal preparation and handling. It contains 35,000 sq ft, six truck docks, five railroad docks, four floor scales, and two balers.

Anchor Steel Warehouse Inc., Kansas City, Mo., will build a \$300,000 warehouse on a tract adjoining its present facilities.



Prefabricated Home Manufacturers' Institute elected these officers: President, Horace N. Durston, vice president, American Houses Inc., Allentown, Pa.; vice president, E. E. Kurtz, Inland Homes Corp., Piqua, Ohio; secretary - treasurer, Fred Samerdyke, Harnischfeger Homes Inc., Port Washington, Wis.

Metallurgical Society of the American Institute of Mining, Metallurgical and Petroleum Engineers elected these officers: President, Dr. Walter R. Hibbard Jr., manager, alloy studies research, General Electric Co., Schenectady, N. Y.; vice president, John C. Kinnear Jr., general manager, Nevada Mines Div., Kennecott Copper Corp.; treasurer, T. D. Jones, American Smelting & Refining, Perth Amboy, N. J.; secretary, Robert W. Shearman of New York.



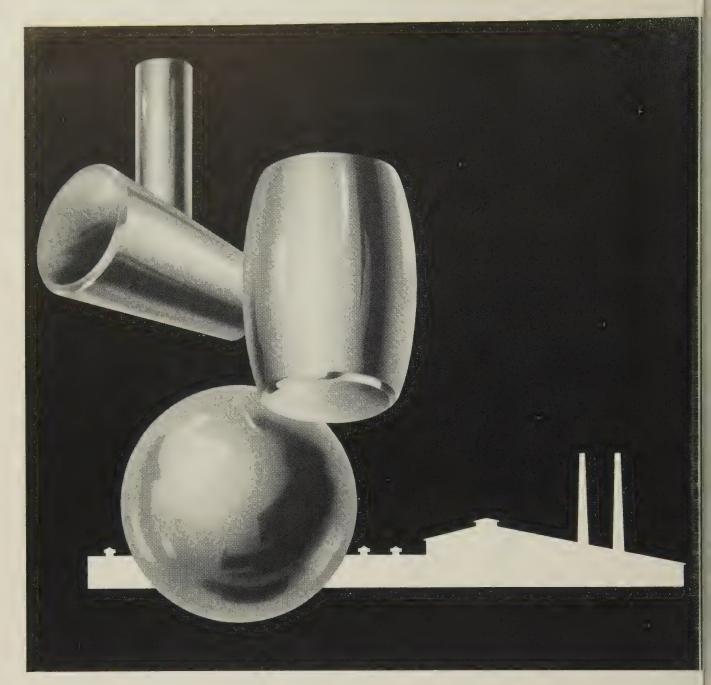
A LITTLE GOES A LONG WAY! Don't overlook vanadium! Though vanadium has been an alloy "staple" for years, it's still one of the most useful and important alloying elements. No other alloy is as versatile as vanadium. And because vanadium is so effective, just a little does a big job. What's more, vanadium is plentiful and economical — actually costs no more than it did thirty years ago! Why not discover — or reappraise — vanadium as it applies to your operations in tool and other alloy steels, large forgings, deep drawing steels, and iron and steel castings.

Versatile vanadium is also used in aluminum-base and titanium-base alloys, in glass, ceramics, inks, coloring agents, and in catalysts for synthetic textiles and petroleum refining. Your nearest VCA Office can tell you more about the advantages and economies of Vancoram Vanadium Products. Call today! Vanadium Corporation of America, 420 Lexington Avenue, New York 17, New York.

BE SURE TO SEE US AT THE AIME OPEN HEARTH MEETING - Hotel Statler-Hilton, Cleveland, Ohio - April 14-16!



Producers of alloys, metals and chemicals



#### the multi-purpose grease with "special" performance

Here is one multi-purpose grease that actually performs better than a great many "special purpose" greases for all types and sizes of bearings — even under extreme *pressure*, temperature and moisture conditions.

Nebula EP retains its outstanding lubricating properties at temperatures above the limits of a number of special heat-resistant greases. But unlike many high-temperature greases, Nebula EP possesses high anti-wear and load-carrying qualities — comparable to those of most specialized extreme-pressure greases. Nebula EP's constant consistency-temperature characteristics are among its most out-

standing features. Another important Nebula EP advantage: excellent oxidation stability, assuring long service and storage life.

Now available in three grades, Nebula EP is well suited to all types and sizes of bearings... can be applied by hand packing, grease cup or gun, or through a centralized system. For complete technical information, contact the nearest Esso Standard Oil Company Division Office: Boston; Pelham, N. Y.; Elizabeth, N. J.; Bala-Cynwyd, Pa.; Baltimore; Richmond; Charlotte; Columbia, S. C.; Memphis; New Orleans.

## NEBULAEP



ESSO RESEARCH works wonders with oil



## Technical

### Outlook

GLASS BEATS HEAT—More products made from Pyroceram seem to indicate that uses for this remarkable glass are still on the increase. Latest shapes: Tubing, rods, and sheets. Products: High temperature piston heads, aircraft structural parts, building curtain walls, ball bearings. They can be heated to 1300° F and plunged into cold water without harmful effects, says Corning Glass Works, Corning, N. Y.

FASTER X-RAY FILM— Eastman Kodak Co. has announced a new industrial x-ray film which is 50 per cent faster than its present product. Called Type KK, it will replace Type K. It is expected to be particularly valuable in cutting the exposure time of thick metal sections. Sensitivity compares favorably with that of the Type K film, the company says, and price will be the same.

**CADMIUM PLATING TECHNIQUE**—Hydrogen embrittlement of cadmium plated, high strength steels can be eliminated by this process: Stop the plating when the deposit is 0.0001 in. thick, and bake the steel to drive out the hydrogen. Any thickness of cadmium plate can then be deposited on the steel without danger of failure. The treatment was developed by Dr. Alexander R. Troiano, professor at Case Institute of Technology, Cleveland.

**FLUORINE RUBBER**—Teflon, Du Pont's successful fluorocarbon plastic, has a rubber cousin. Christened "Viton," the new elastomer is about to graduate from pilot to commercial production. It's said to have unequaled resistance to oils, fuels, and solvents at temperatures above 400° F. It will be available for civilian uses such as seals, insulation, gaskets, hose, and fuel cells.

STRONGER BUCKETS—Present methods for making aircraft turbine buckets of Udimet-500 (a nickel-base alloy, age hardened by additions of titanium and aluminum) compromise strength to achieve ductility. Research at Thompson Products Inc. shows that the ductility depends on the

microstructure of the Ni<sub>3</sub> (Al, Ti) precipitate, and high hot strength on the grain size. Under study are processing methods which will control both properties independently, leading to greater strength with ductility.

**RECTIFIER FOR HOT SERVICE**— Westinghouse scientists have developed a silicon carbide rectifier that operates up to 1300° F—above the melting point of magnesium and aluminum. First application will be in control equipment for rockets, missiles, and high-speed aircraft.

**GLASSED STEEL TIPS**—Pfaudler Co., division of Pfaudler Permutit Inc., Rochester, N. Y., offers these suggestions for glass-lined vessels: I. Keep operating temperatures under 450° F. 2. Keep temperature differentials within 200° F. (Range declines as operating temperature increases, dropping to 115° F at 450° F.) 3. Don't weld to the tank proper. Use arcwelding for the jacket. Keep at least 2 in. away from tank.

whose dirt?—Has the community pointed an accusing finger at your smokestack? Stanford Research Institute, Menlo Park, Calif., has a new method for finding out where air pollution is really coming from. It uses a uranine dye and field detection units that can make quantitative measurements of its dispersion in the air.

**AUTOMATION SCORES AGAIN**—This time it's the drop hammer, almost the last stand of muscle, which is being automated. Chambersburg Engineering Co. has introduced an electrically controlled gravity drop hammer that can utilize automatic feeding devices.

**SAND SUPPORT**—Slab grinders in a Swedish steel mill support the slab on a bed of sand. It damps vibrations, reduces wheel wear, and makes loading and unloading easier. Although the grinder table oscillates, the weight of the slabs is enough to keep them from shifting in the sand.





Parts are being lowered into a agitated etchant for . . .

## Deburring with Ultrasound

Process is a natural when burrs are hard to remove any other way. Example: In replacing manual scraping of fine burrs from a precision part, it cuts deburring costs about 98 per cent

WHEN the removal of small burrs from close tolerance parts by conventional methods is difficult or expensive, consider ultrasonic deburring.

The recommendation comes from

production men at Research Associates Labs Inc., Los Angeles. They have this to say about the process:

No Substitute — Ultrasonic deburring won't take the place of standard techniques like filing, grinding, honing, and sandblasting. It becomes practical when other methods start giving poor results.

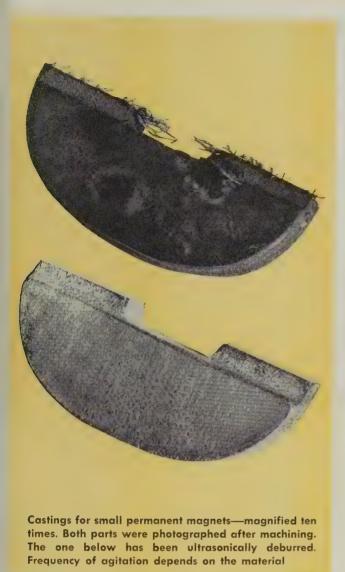
bing action, critical dimensions are

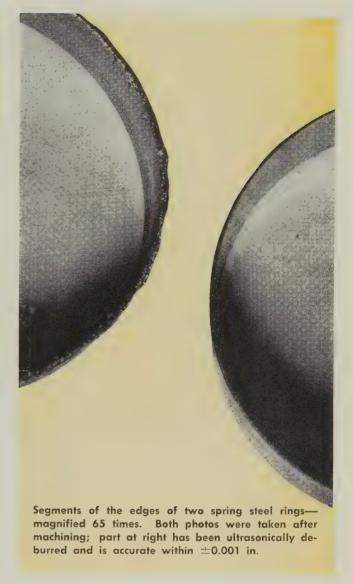
It can, for example, get rid of burrs invisible to the naked eye—and will do it without altering tolerances of precision instrument parts as much as 0.000005 in.

Conventional ultrasonic equipment will handle the job.

How It Works—Parts are dipped in a solution, which is ultrasonically agitated. As a rule, the solution is water, containing a small quantity of acid or alkaline etchant. The kind of etchant is determined by whether the parts are ferrous or nonferrous.

The solution attacks burrs and many types of foreign matter without removing appreciable quantities of the parent metal.





Wave frequencies are varied to accommodate materials with differing acoustical properties. Evidence shows that frequencies well below 30,000 cycles per second will meet nearly all requirements. The frequencies can be obtained with a variety of commercial magnetostrictive transducers.

Cleanser—Besides being an effective eradicator of surface burrs, ultrasonics in a mild etching solution quickly remove unwanted materials in normally inaccessible recesses like holes with backdrafts or undercuts.

The etchant content of processing solutions is so small that parts could be immersed for several hours without undergoing noticeable changes, if the solutions weren't ultrasonically agitated. Cold-water rinsing and

infrared drying prevent unwanted etching following deburring.

Tooling—Small metal parts can usually be deburred in batches without special fixturing at the rate of about 100 an hour. Large and intricate parts are sometimes fixtured to facilitate deburring in specific areas, but, since standard holding devices can be used as fixtures, no special tooling problem is posed.

Components with especially large or heavy accumulations of burrs may be partly deburred by conventional methods to minimize ultrasonic processing time.

Because the method has no measurable effect on the chemical and physical properties of metals, materials should be heat treated or hardened beforehand to minimize the need for cleaning operations.

In general, any metal part that has been degreased will become microscopically clean when it is ultrasonically deburred—this adds to the effectiveness and economy of subsequent operations, such as welding, brazing, soldering, plating, and spray finishing.

How Much?—Cost is not always an important consideration simply because comparable work can't be done any other way. But it is relatively low in almost every case.

For example, where manual scraping is now required to remove fine burrs from precision instrument components, the process can reduce deburring costs about 98 per cent. While electropolishing methods are satisfactory for gears and shafts, ultrasonic processing can save close to 50 per cent.

April 7, 1958

## Leading Uses of Plastic Laminations

#### **TRANSPORTATION**

Automobile, bus & airplane interiors Automotive components Railroad car ceilings, wall paneling Mobile home interiors Shipboard bulkheads

#### INDUSTRIAL

Storage tanks
Steel drums
Display cases
Chemical resistant ductwork

#### **APPLIANCES**

Air conditioners Hi-fi components Portable TV & radio cabinets Record player cases

#### HOUSING

Furniture Doors Lamp bases Kitchen walls

#### BUSINESS

Typewriters
Computer cabinets
Desk tops
Magnetic maps & bulletin boards

#### **OTHERS**

Camera housing Luggage Picnic jugs Boat decking Rifle & pistol cases



Laminating vinyl to steel sheets is continuous process at the Denver plant of Clad-Rex Steel Co. Sheets are separated by cutting through the plastic film

## Plastic-Coated Metals Ride Uptrend

The product is catching on. Fabricators say it is easy to form by ordinary methods. Product's advantages include high styling, unlimited color, chemical resistance

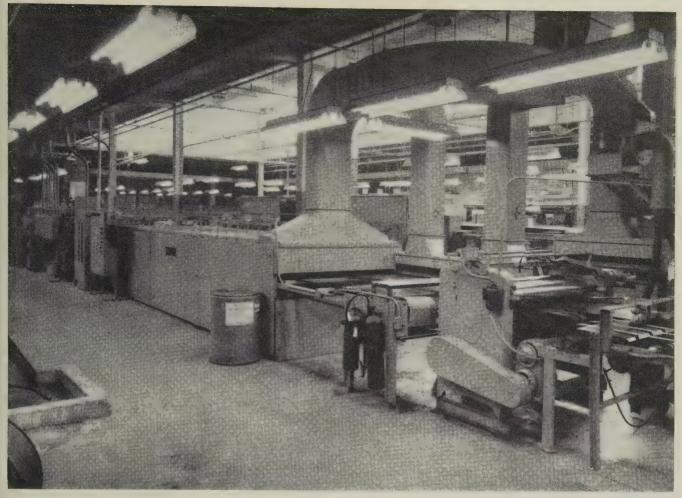
"PLASTIC-LAMINATED steel is stepping out of the laboratory and taking its place as a production material in a growing number of applications."

That's the way U. S. Rubber Co., New York, assesses the progress of a product which was just getting started a little more than three years ago (STEEL, Dec. 6, 1954, p. 116). Its Marvibond process is one of several being used to produce the material.

Catching on — Fabricators have

been quick to recognize its production advantages (it's easy to work with) and product advantages (chiefly high styling, an unlimited color range, and chemical resistance).

A fabricator comments: "We can roll-form, lock-form, and deep draw laminates in the same manner and with the same limits as cold rolled, deep drawing steel. Laminates can meet high heat specifications with-



This machine laminates magnesium to vinyl at Shwayder Bros. Inc., Detroit. The drying chambers are controlled to bring the temperature of the magnesium sheet to 300° F

out delaminating. We can't arcweld the metal, but we can spotweld it with special equipment.

Says J. W. Kendrick, vice president, Met-L-Wood Corp., Chicago: "Few fabricating problems worry firms working with plastic laminates. Vinyl-metal sheets are perforated as easily as base metal sheets without vinyls. Ease of fabrication and improved properties justify their use, although they cost more than other types of finishes."

Also cited often: A low percentage of rejects. For example, a laminator supplied a major automaker with 250,000 kick shields. None was rejected. An appliance firm had the same experience with 7200 plastic-metal television cabinets.

Application Range—Indoor uses predominate. Shwayder Bros., Detroit, produces vinyl-clad magnesium luggage and vinyl-clad steel furniture. It furnishes clad steel to other manufacturers for fabrication into automobile interiors, portable

television cabinets, picnic tables, display cases, and beverage coolers.

Met-L-Wood says its laminates are used for railroad car ceilings, doors, partitions, seat backs, and convector panels. They also find application in interiors of buses and aircraft and in steel tanks in which the chemical resistance of vinyl prevents corrosion.

Standard Can Corp., Pittsburgh, reports excellent results with plastic covered, cold rolled strip steel for wastebaskets and trays.

Methods—U. S. Rubber has a hot method of continuous laminating, using thermoplastic adhesives and polyvinyl chloride. The company supplies vinyls to laminators who apply a 4 to 20 mil film of plastic to base metal—steel, aluminum, copper, brass, or magnesium. It has some 15 licensees.

National Supply Co., Pittsburgh, sprays and bakes vinyl plastic on the inside of drill pipe and tubing subject to corrosion fatigue. A plas-

tic that withstands high temperatures in deep wells has been developed by researchers.

Jones & Laughlin Steel Corp., Pittsburgh, is marketing rigid polyvinyl chloride tubing which is jacketed with resistance welded steel pipe. The corporation expects to find wide applications where corrosion is a problem, particularly in oil production.

U. S. Steel Corp., Pittsburgh, is experimenting with the material. It is testing vinyl coated sheets on buildings at its Saxonburg, Pa., sintering plant.

Outlook—"Three years ago, laminates were only under development. We haven't reached our full potential yet, but we're clearly headed in that direction," say U. S. Rubber sales officials.

"The product is gaining stature; fabricators are gaining experience; and product quality is standardized at a high level," concludes Mr. Kendrick.



This 27 ft Rotoblast handles one totebox of material. It's dumped into the hopper in the foreground which loads the unit. The empty totebox is placed under discharge, saving extra handling

## **Unit Saves Cleaning Time**

One large blast cleaner does more than double the work of two small machines: It takes half as many men to operate it. Here's how a cleaning jobber benefits

AN OUTSIZE machine more than doubled blast cleaning production and cut labor in half at the Bellevue Porcelain Enameling Co., Detroit.

The firm cleans welded stampings, forgings, and fabricated assemblies for automakers and the electrical industry. The equipment was originally purchased to handle the firm's own porcelain requirements.

Two-Pronged Efficiency — Under the old setup, material handling was a problem at Bellevue. Incoming toteboxes had to be dumped into two others for each 14 ft Pangborn Rotoblast machine. After cleaning, the loads were returned separately to the original totebox.

The new machine, a 27 ft Rotoblast, eliminates the double handling. One totebox is enough to carry one load to and from the machine.

Faster cleaning is provided by two wheels in the new machine. The

old 14 ft units, now standby equipment, have only one. Better abrasive coverage assures uniformly clean parts.

Time—It takes about 4 minutes to clean the easier parts and up to 14 minutes for tough ones like engine connecting rod forgings. Loads vary from 225 lb (conveyor hooks) to 2300 lb (forgings).

The larger machine also reduces operator effort. He merely pushes a button to start the loader. Blast and tumbling cycle are automatic.

Bellevue uses Pangborn G-40 and G-50 angular grit. During operation, a cleaning and reclaiming unit removes scale and debris. A rotary scalper removes large fragments. Smaller particles and abrasive fall through a screen onto a conveyor which carries them to a separator. Spent abrasive and scale are removed. Good abrasive drops into a storage bin.

#### **Extends Lift Range**

Telescoping boom carries hoist farther, permits easier handling of bars, pipes, screw stock

A TELESCOPING boom solves the problem of loading or unloading bars, rails, pipes, and similar long materials.

Formsprag Co., Van Dyke, Mich., formerly unloaded bar stock by hand and dragged it through a doorway to a crane for transfer to a storage area.

Michigan Crane & Conveyor Co., Detroit, designed the telescoping boom girder shown. It carries a hoist from the building to the truck. Loads are lifted easily into the stock area.

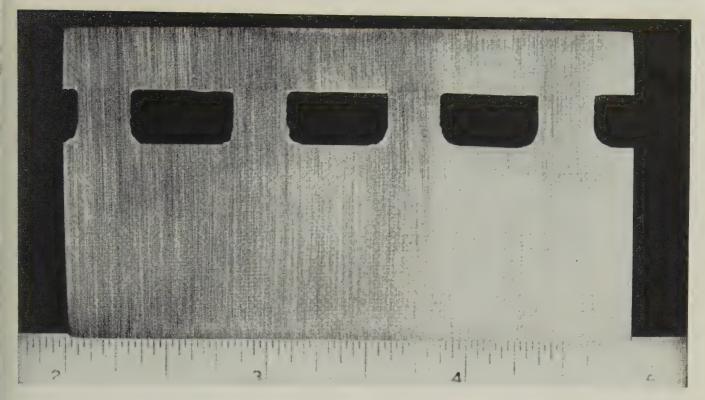
The hoist runs on a single girder and can be moved to a crane in another bay.

A switching point also permits running of the hoist to rod or bar storage areas.



GIVES HOIST
. . . a longer reach





Close-up of Hortonclad section shows  $\frac{1}{4}$  by  $\frac{1}{2}$  in channels which can be located any distance between upper or lower surfaces. Cladding is on top; base plate is mild steel

## Hollow Plate Speeds Heat Exchange

Built-in channeling cuts the cost of heating or cooling big equipment. Clad material is a combination of corrosion resistant metals and mild steel. It can be formed

A NEW construction material called Channeled Hortonclad makes the heating or cooling of heavy duty equipment comparatively simple.

Applications include heated platens in laminating presses, venturi sections in hypersonic wind tunnels, and critical cooling partitions in chemical reactors, says the maker, Chicago Bridge & Iron Co.,

Chicago.

Because the plates can be roll formed, they are expected to be used for pressure vessels and atomic reactors. Their greatest potential: Heavy chill plates for handling hot work and heated platens and forms for molding assembly.

How It's Made—Channeling patterns are machined into a heavy base plate (usually steel). An al-

loy cladding plate is placed on the channeled side. When brazing material is in place and the edges have been welded shut, the channels are attached to a pump and evacuated. The assembly is heated in a vacuum furnace. Cladding is held firmly to the base by the vacuum in the channeling.

Materials—The Chicago firm says it has tried many metal combinations. The platens for plastic laminating presses were made of air hardening, 60 per cent chrome steel joined to a mild steel base. Many production plates for wind tunnels and reactors are constructed of 5/16 in., Type 405 stainless.

All cladding materials available as solid clad plates can be used for channeled plates. They include: Austenitic stainless 304L, 316L,

321, 347, 318, and 17-7 PH; straight chromium stainless (400 series); and materials like nickel, Inconel, Monel, and the Hastelloys. Titanium, zirconium, bronze, and tantalum will be used in the near future

Patterns—Channeling inside the plate may be of practically any design. Layouts for large plates are often divided into independent coils to regulate temperature independently in several sections (as in edges or openings) and to reduce pressure drops by using several short sections in place of a long one. Connections are made through drilled and tapped holes in the base metal.

Form and Size — The biggest plate made to date was 60 by 220 in. by 1 19/32 in. Such plates have been rolled to a 12-ft radius in one plane, rolled to the same radius in the opposite direction, then flattened without affecting the bonds or channeling.



Varepack is used in building large generator rotors. Operations require frequent starting, stopping, inching, jogging, and turning at various speeds. Operator holds control box; regulating cabinet is in right background

## All-AC Drive Answers Need

Alternating current, wound-rotor motor is heart of variable speed system. Thyratron tubes control current in motor secondary, producing smooth speed changes

THE NEED for better adjustable speed, alternating current drives has prompted a new development, called Varepack. It will serve a host of metalworking uses (see box above).

The manufacturer, Electric Products Co., Cleveland, lists these advantages:

- It operates from alternating current.
- It is connected directly to the load.
- Speeds can be selected or changed while the equipment is idle or in motion. It can be done manually or automatically.
  - After the speed is selected, it

remains constant regardless of fluctuations of load or temperature changes of the equipment.

The System—The drive consists of a wound-rotor induction motor. an operator's control station, and a control cabinet. In the control cabinet are a motor starter, a set of thyratron tubes operating as an impedance control, and a closedloop regulating system. The regulating system is designed to link motor output to the process function -speed, tension, position, pressure, flow, or other variables.

How It Works-Torque and speed of the wound-rotor motor are controlled by regulating the secondary current with the thyratron tubes. When the motor primary is energized and the speed reference setting is greater than the motor speed, the control circuit allows the gas tubes to send current to the motor secondary. The current produces a field which reacts with the field of the motor primary and produces torque, causing the motor to accelerate. As the motor speed approaches the speed reference setting, the control circuit reduces tube current and motor torque; the motor no longer accelerates but produces only enough torque to drive the load at the required speed.

Engineered System - Charles T. Harmon, sales manager of the Varepack Div., emphasizes that the product is not a standard, off-the-shelf, packaged drive. "It is not the answer to all problems. It is an engineered drive whose regulation, efficiency, range, and speed of acceleration and response can be tailored to the requirements of the application," he explains.



## New efficiency with the drive built specifically for appliances

The U.S. PowerGrip "Timing" Belt has an efficiency of close to 100%. That's why the makers of many kinds of appliances can now combine simplicity of design with split-second response. PowerGrip has no slippage, no take-up—allows short and fixed centers, high ratios. No need for lubrication or housing devices, because there is no metal-to-metal contact. Quiet! Handles speeds up to 16,000 f.p.m.

or so slow as to be imperceptible to the eye. Vibrationless! Simplify and improve your power transmission unit with U.S. PowerGrip "Timing" Belts.

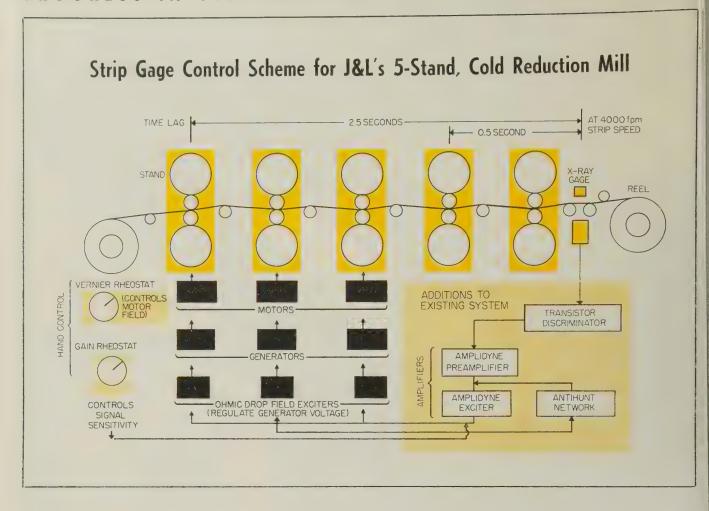
These unique transmission belts are available, along with expert engineering service, at your "U.S." power transmission distributor, or by writing us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



**Mechanical Goods Division** 

## United States Rubber

See things you never saw before. Visit U.S. Rubber's new Exhibit Hall, Rockefeller Center, N.Y



## J&L Uses Simplified Gage Control

System it devised does not shoot for the ultimate. It strikes happy medium between a high cost operation and standard manual control by the roller

A COMPROMISE on gage control for a tandem strip mill is paying off at Jones & Laughlin Steel Corp.'s Aliquippa (Pa.) Works. J&L recommends: A system should be simple enough to keep maintenance costs low, but it should do its job better than the roller can.

"We strive to keep the product as close as practical to ordered gage," explains O. C. Gochenour of J&L's maintenance group. "We might obtain a control system that could regulate gage to 1 part in 100,000,

but the increase in production cost and maintenance would surely be reflected in product price."

Mr. Gochenour described his company's system (see sketch) at a conference on instrumentation for the iron and steel industry at Pittsburgh.

How It Works—J&L designed its system in 1956 for its 42 in., 5 stand, cold reduction mill in its Tin Plate Dept. at Aliquippa. It replaced a manual system. Corrections are made in ½ second now,

vs.  $2\frac{1}{2}$  to 6 seconds before.

An x-ray gage feeds its signal into a transistor discriminator. This produces a positive or negative direct current signal, depending on whether the gage is light or heavy, and indicates by the amplitude of the signal how big the deviation is. The signal is amplified in an amplidyne circuit and fed through ohmic drop exciters into the voltage regulators for No. 1, 2, and 3 generators. The voltage of all three generators is changed equally to correct for the deviations measured by the x-ray gage.

A manual rheostat is provided so the roller can reduce the effectiveness of the signal (adjust the gain) for the lighter gages, and he also uses his vernier rheostat to adjust

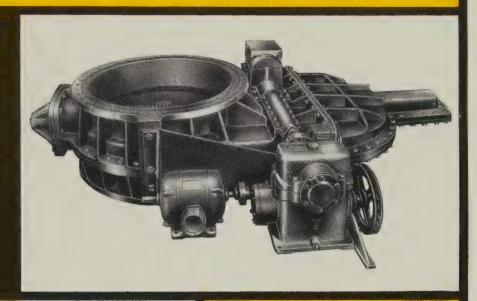
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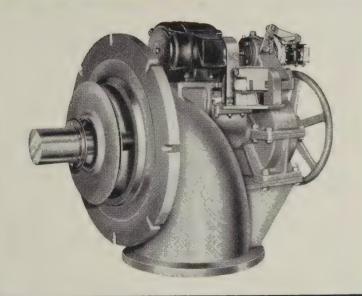
## BLOW-OFF VALVES COLD BLAST VALVES

Both Motor Driven for Fast, Reliable Operation

#### Cold Blast Valves

Soundly engineered for dependable service, these valves are used on the cold blast main entering hot blast stoves. Diameters available: 24", 28", 36", 42" and 48". Write for Bulletin.





#### Blow-Off Valves

With a long record for unfailing service, these Bailey Valves relieve pressure in blast furnace hot blast stoves. They are made in 15½" and 18" sizes. Write for Bulletin.

These valves also available in Hand-Operated Models

WILLIAM M. COMPANY

ENGINEERS

(EADERSHIP THROUGH QUALITY

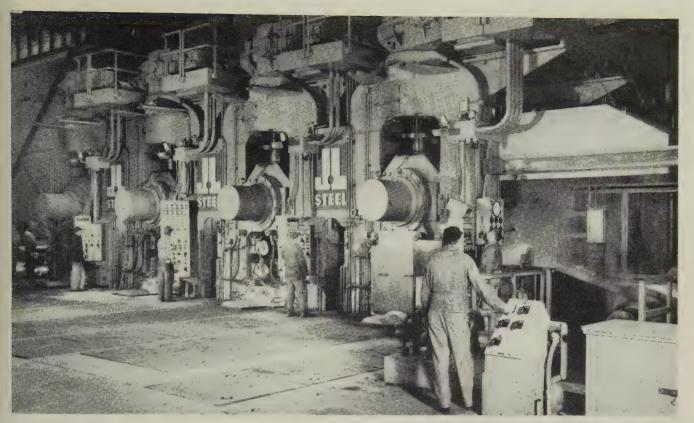
PITTSBURGH 16, PA



LOOK FOR THE YELLOW TRIANGLE PRODUCT OF WICKWIRE SPENCER STEEL DIVISION THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque \* Amarillo \* Billings \* Boise \* Butte \* Denver \* El Paso Farmington (N. M.) \* Fort Worth \* Houston \* Kansas City \* Lincoln (Neb.) \* Odessa (Tex.) \* Oklahoma City \* Phoenix \* Pueblo Salt Lake City \* Tulsa \* Wichita \* PACIFIC COAST DIVISION—Los Angeles \* Oakland \* Portland \* San Francisco \* San Leandro Seattle \* Spokane \* WICKWIRE SPENCER STEEL DIVISION—Boston \* Buffalo \* Chattanooga \* Chicago \* Detroit \* Emlenton (Pa.)

New Orleans \* New York \* Philadelphia



The 77 in., cold reduction mill at J&L's Cleveland Works is equipped with gage control system proved out at Aliquippa Works on a 5-stand mill

the tension between stands No. 1 and 2 by slowing down the stand No. 1 motor. This can be necessary if the gage runs out of range, which could happen if the second of two coils welded together was 0.010 in. thicker in gage than the first. A warning device lets the roller know when the correction has reached 75 per cent of maximum in either direction.

The Problem—Before the control system was installed, strip thickness had been monitored by an x-ray gage mounted on the delivery side of the fifth stand. The roller watched the gage dial and made corrections manually by changing the speed of the No. 1 stand motor with a vernier rheostat which adjusted the motor field. This acted to change strip gage by increasing or decreasing tension on the strip. It took 2½ to 6 seconds to get

picked up the off-gage signal. In that time several hundred feet of steel could travel through the mill. Because of the time lag, it seemed

back on gage after the roller's eye

Because of the time lag, it seemed unwise to duplicate the roller's actions with an automatic control which would adjust the motor field, but the principle of adjusting gage by varying tension (rather than screwdown) appeared well worth maintaining.

Four Requirements — J&L engineers decided that an automatic gage control system for the 5-stand mill should meet these qualifications:

1. A single x-ray gage at the delivery side of the last stand. (If placed elsewhere, as between stands No. 1 and 2, it would be harder to maintain and more vulnerable to wrecks. Two gages would double the number of standards to set up, check, and maintain.)

2. Constant speed on stand No. 5. (Stand No. 5 generator and motor are operated fully loaded, and this load determines mill speed. An accelerating load would overload the system and increase strip breakage.)

3. Gage regulation by tension. (Experience showed that tension changes at stands No. 1 and 2 easily corrected for the average 8 mil difference in hot band gage. Position regulators on mill screws would only add complications.)

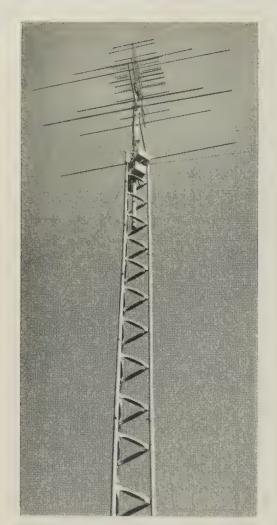
4. Reaction speed fast enough to

follow hot band gage changes. (Response had to be enough faster than manual to improve strip gage quality and justify the system's cost.)

Time Lag Reduced — The long time delay for manual control is reduced two ways: 1. The tension change is produced at a point where transport time to the gage head is about ½ instead of 2½ seconds (the bare minimum for manual control). 2. The speed is changed by regulating generator voltage, which is a faster way to change speed than by regulating the motor field, as is done with conventional control.

Second Unit — J&L recently installed a new, 4 stand, tandem cold mill at its Cleveland Works. Its gage control system is a slightly modified version of the Aliquippa installation. The first two stands are regulated by the gage control to produce the proper tension between stands No. 2 and 3.

According to Mr. Gochenour, the system is so simple that it represents a \$50,000 saving over others proposed for the same purpose. Furthermore, he says, it's the only system which will roll welds at full speed.

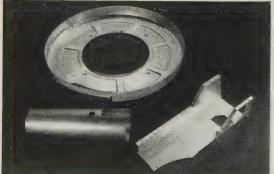


#### Above: MUSCULAR MAST

Customers buy strong, weather-resisting TV antenna masts and towers made of zinc- and aluminum-coated Armco Welded Steel Tubing because they offer ample strength, durability, and lasting good looks.

#### Below: FOR DURABLE DRYERS

Parts for home laundry dryers made of Armco ALUMINIZED STEEL Type 1 offer important sales features for quality-conscious appliance buyers. They defy heat and corrosion; improve performance by reflecting radiant heat more efficiently.



#### Right: MAINTENANCE COST 75% LESS

"With our building made of Armco Aluminized Steel, maintenance cost is about 75 per cent less than for other kinds of structures." This building owner's own words point out a strong sales advantage of Armco Aluminized Steel Type 2—low maintenance.

## See How the Quality

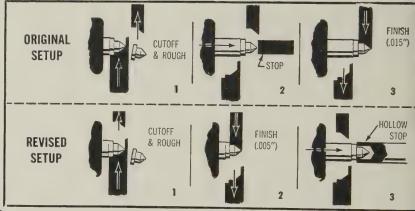
Today, quality tips the scales of competition. Customers demand top value for every dollar. That's why the built-in quality advantages of these special Armco Steels can help your metal products sell easier, faster.

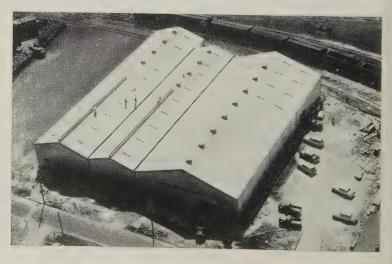
Armco supplies *more than just steel*. It's the "something extra" that products need to stand out in today's highly competitive *quality* market. Here's how:

Every Armco Special Steel offers extra quality advantages because each was especially developed to do jobs that ordinary steels can't do. You can select the specific grade of special steel that delivers the *exact* product features your customers want.

With your product needs in mind, check over these Armco Special Steels. Perhaps one or a combination of them can help give your products an edge over competition. For *complete* information, fill in and mail the coupon or call your nearby Armco Sales Office.

ARMCO STAINLESS STEELS, in sheet, strip, bar, and wire, endow your products with lasting beauty, rugged endurance, and stubborn resistance to corrosion, heat, and wear.





## Advantages of These Special Armco Steels

#### PRODUCTS AN EDGE ON COMPETITION

**ARMCO ALUMINIZED STEEL TYPE 1,** a special hot-dip aluminum-coated steel, is an excellent reflector of radiant heat, defies combinations of heat and corrosion, stays strong.

**ARMCO ALUMINIZED STEEL TYPE 2,** also hot-dip coated with aluminum, gives outdoor products extra long life. Tests show the aluminum coating outlasts a commercial zinc coating on unpainted galvanized steel sheets 3-to-1 in the atmosphere. It's practically maintenance-free—needs no paint.

ARMCO ZINCGRIP® STEEL assures customers of complete zinc protection in drawn or formed products because its tightly adherent coating holds fast despite severe fabrication. Equally-workable Armco ZINCGRIP PAINTGRIP® gives your products this same zinc protection, plus a special millapplied phosphate film that takes paint immediately and holds it longer.

**ARMCO ENAMELING IRON** is a specially processed base metal for porcelain enamel finishes that sell. It's tops in uniformity. Its high purity keeps enameling defects at a minimum. It won't sag at firing temperatures. It's made *only* for porcelain enameling.

**ARMCO WELDED STEEL TUBING** can give tubular products great strength, as well as the protection of durable coatings of zinc and aluminum.

#### SPECIAL ARMCO SERVICES

Armco sales engineers and technical specialists will be glad to work with you in selecting the Armco Special Steels that will give your products the quality advantages you want. They will also be happy to consult with your designers. And perhaps they can suggest fabrication methods that will help speed production and keep costs low.

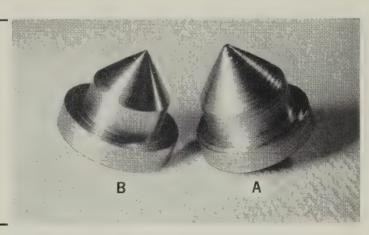
But Armco doesn't stop with technical information. Our marketing specialists stand ready to bolster your product promotion with special aids for sales and marketing.

Why not learn *more* about these special Armco services. Just write us at the address below, or call your Armco Sales Office.

Other Armco Steels for top-quality products include Cold-Rolled Paintgrip, High Strength Steels, Electrical Steels, Long Ternes, and high-quality Hot- and Cold-Rolled Steels.

## HOW A STUDY BY AN ARMCO STAINLESS MACHINING SPECIALIST PAID OFF—IN IMPROVED FINISH, FASTER PRODUCTION

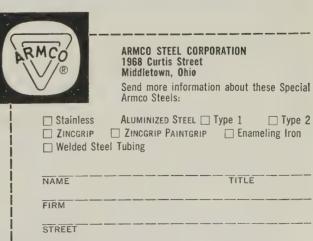
Drawing (left) shows the simple changes in set-up recommended to a manufacturer of stainless steel needle valve points by an Armco Stainless Machining Specialist. The photo (right) shows the big difference they made. The original valve point (A) had poor finish—no good at all for a leak-proof valve seat. The present product (B) has an excellent finish. What's more, machining time is less.



# ARMCO

ARMCO STEEL CORPORATION
1968 Curtis Street, Middletown, Ohio

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. THE ARMCO INTERNATIONAL CORPORATION



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## Aircraft's Headaches

The industry is faced by a lot of machining problems brought about by the shift to high strength alloys for aircraft and missiles. Here's one of its first reports

THE MACHINING of high strength alloys for aircraft and missiles poses a host of problems, reports the Air Materiel Command in a survey of 31 experts with airframe, engine, missile, and machine tool companies.

Makers of airframes cite these problems—in order of importance:

Milling, high strength steels—End milling and slotting are tough; tool life is practically nil.

Routing, high strength steels and high temperature alloys—The job is practically impossible with hand feeding.

**Drilling**, high strength alloy sheets—High thrust makes hand drilling impractical; drill life is short.

Grinding, high strength steel, high temperature alloys, and titanium—Conventional methods cause severe surface damage and detrimental residual stresses.

**Tapping,** high strength steels and high temperature alloys—It's hard to tap  $\frac{1}{4}$  to  $\frac{3}{8}$  in. holes; tap life is short.

Turning, high strength and stainless steels, and titanium—No specific problems are cited.

**Broaching**, stainless and high strength steels—Production rates are low; tool life is poor.

Drilling, high temperature alloys—Small diameter (3/32 to 3/16 in.) deep holes (1 to 3 in.) are difficult, drill breakage is severe.

Milling, high temperature alloys—Side and face milling are slow; tool life is poor.

Grinding, high temperature alloys and titanium—Problems are surface damage and detrimental residual stress conditions.

Here are the problems most troublesome to missilemakers (in order of importance):

Tapping, high strength steels—Blind holes 3/16 to 3/8 in. are a

critical production operation. Tap breakage is severe.

Drilling, high temperature alloys
—Small diameter (1/8 to 1/4 in.)
deep holes (2 to 4 in.) are difficult.
Drill life is poor.

Milling, high strength steel—End, slot, and side milling are slow; cutter life is poor; production rates are low.

Grinding, high strength steels and high temperature alloys—Surface damage and detrimental residual stresses result.

Here is how enginemakers rate their problems:

Turning, high strength and stainless steels, and titanium—This is the top problem, but specific difficulties are not cited.

**Broaching**, stainless and high strength steels—Production rates are low; tool life is poor.

Drilling, high temperature alloys—Small diameter (3/32 to 3/16 in.) deep holes (1 to 3 in.) are difficult. Drill breakage is severe.

Milling, high temperature alloys —Side and face milling are slow. Tool life is poor.

Grinding, high temperature alloys and titanium—Conventional grinding causes surface damage and detrimental residual stresses.

#### **Suggestions**

The report points up some future needs in the machining of these metals. Included are: Lower feeds and speeds and greater rigidity on skin and spar millers and profilers, controlled mechanical feeds for drilling, more strength and rigidity in fixtures.

None of the electromachining methods has been widely used in production, says the report, but there is considerable hope that the techniques will help with materials harder than 60Rc.

## Tip on Gun Drilling

Special machines aren't always needed. Here's how one company saved \$9 on a cast iron part

GUN DRILLING on a turret lather has become routine at the Hartford Empire Div., plant of Emhart Mfg. Co., Hartford, Conn.

One of ten pieces machined this way is a cast iron part requiring a hole 145/8 in. long and 11/4 in. in diameter.

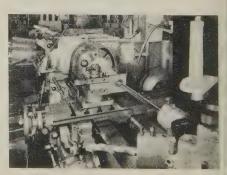
The saving in machining costs on this job is estimated to be at least \$9 a part.

How It's Done — The part is chucked in a No. 7A Jones & Lamson turret lathe on the previously turned large diameter (see photo below). The opposite end is turned to fit the bearing of an outboard support. This end is then prepared for gun drilling by spotting, drilling, boring a hole 1 in. deep and 1½ in. in diameter.

The gun drill is used to finish the hole. The piece is drilled at 253 rpm with a feed of 0.005 in. per revolution. The gun drill is made by Madison Industries Inc., Big Rapids, Mich., and has a Kennametal Grade K6 carbide insert tip.

Holes made by gun drilling are straight and round. Scrap losses are less than when it required seven operations to make the holes.

The Old Way—After rough turning the large end and facing the flange, the flange end was chucked and a gun drill was used to drill a 1 7/32 in. hole with a different setup. The hole was reamed to fit a broach and the hole broached to 11/4 in. The part was put on an arbor and the large diameter and flange finish turned. Then it was turned around and the hub end faced. A groove for an O-ring was machined on the stub arbor.



Gun drill setup. Starter drill is in foreground. Workpiece is shown in inset



This rushing, molten stream may wind up as a forged steel rotor for a power turbine . . . or a cast steel component for a 2000 ton hydraulic press. The specifications will tell the story.

At Erie Forge & Steel specially trained, experienced metallurgists, chemists and engineers team up to assure you that correct chemical, physical and quality standards are met. The open-hearth melters make many tests of the molten bath to

determine exact composition, temperatures, conditions of slag, to control hydrogen and other gases and to eliminate harmful elements in every heat. Quality control begins at the open-hearth and closely follows every operation to the shipping dock. Forging or Casting . . . this "family" influence disciplines the end product to meet exactly what you specify. Your steel forging or casting work is in competent hands here. Consult with us.

## ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

## A Review of the Phosphate Coatings

#### **Specified for the Protection of Metal Surfaces**

By HUGH GEHMAN, Assistant Manager, Product Development Dept., AMERICAN CHEMICAL PAINT COMPANY

Phosphate coatings are protective inorganic finishes that actually change the chemical nature of metal surfaces. The metal reacts with the applied phosphate solution to form a nonmetallic, crystalline coating which serves to:

- Improve paint adhesion
- · Provide protection against corrosion
- Increase lubricity of friction surfaces
- Facilitate mechanical deformation of metals
- Decorate—in many instances

Satisfactory protection of steel, zinc and aluminum surfaces against corrosion, paint peeling and blistering, and hard wear requires precision methods of chemical conversion coating.

#### **Types of Conversion Coatings**

There are seven classes of chemical conversion coatings commonly specified and used throughout industry to-day. They are as follows:

Zinc-iron phosphote (ACP Granodine®). This is the heaviest type of coating (gray in color) used for prepaint treatments on steel, iron and zinc surfaces. The process requires five or six operations: cleaning; rinsing; rust removal, if necessary; coating; rinsing; and a second rinse. Coating weight ranges from 100 to 600 mg per sq. ft.

Medium or large volume production of automobile bodies, appliances, projectiles and cabinets can be handled effectively.

The coating solution improves paint adhesion by forming a crystalline deposit over the metal surface. This deposit is rough, as revealed microscopically, and so offers an ideal gripping surface for paint particles.

Manganese-iron phosphate (ACP Thermoil-Granodine®). This is a heavy black coating used on friction surfaces to prevent galling, scoring and seizing of parts. Typical metal parts treated are pistons, piston rings, gears, cylinder liners, camshafts, tappets and various small arms components.

Iron phosphote (AČP Duridine®). This is a comparatively new process that places a light coating on surfaces for improved paint adhesion. Since cleaning and coating occur in the same bath, it has only three to five stages.

The iron phosphate treatment is a spray process suited for medium to large volume, large or small work. Precleaning is normally unnecessary, an economy factor in its favor.

Products protected by this process are steel or iron fabricated units, such

as cabinets, washing machines and refrigerators. Weight of coating is 50 to 100 mg per sq. ft.

Zinc phosphote (ACP Lithoform®). This is a crystalline coating produced on galvanized iron and other zinc surfaces—also cadmium—for improving paint adhesion. The purpose of the coating is to provide a paint-gripping surface and to prevent the reaction between acidic components of the paint and the zinc metal, with the formation of soaps and loss of paint adhesion.

This coating is applied in weights of 75 to 500 mg per sq. ft. There are no limitations on volume or production or on size of products treated. Zinc phosphate coating is used on zinc alloy die castings, zinc or cadmium plated sheet or components, hot dip galvanized stock, and Galvanneal.

Amorphous phosphote (ACP Alodine®). This is a relatively new protective coating for aluminum and aluminum alloys. It may be used in place of anodic deposition for improved paint adhesion and corrosion resistance.

This coating is practical for production in any volume. Coating weight is 100 to 600 mg per sq. ft. Products treated include helmets, belt buckles, aircraft and aircraft parts, bazookas and rocket motors, roofing and siding. Particularly good when aluminum is painted prior to forming.

Zinc-iron phosphote for oil obsorption (ACP Permadine®). This is a relatively heavy coating adapted to the retention of rust-inhibiting drying or nondrying oils and waxes on ferrous metal surfaces. The coating is applied to a weight of 1000 to 4000 mg per sq. ft.

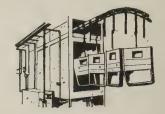
The process is satisfactory for large or small work in any volume—nuts, bolts, hardware, guns, tools, etc.

Zinc-iron phosphote for metal forming (ACP Granodraw®). This is a specialized coating used in conjunction with a suitable lubricant to facilitate the cold mechanical deformation of steel. The coating acts as an anchor for the lubricant throughout drawing, extrusion, and cold forming operations.

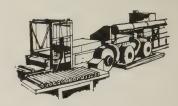
It is a successful treatment for products such as blanks and shells for cold forming, heavy stampings, impact extruded shapes, drawn wire and tube.

For more complete information about any one or all of these chemical conversion coatings, contact an ACP sales representative or write us at Ambler, Pa.

Typical Installations of Phosphate Coating Systems



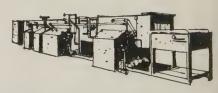
Customer: Truck manufacturer
Problem: Preparing cab parts for painting
Cycle: Phosphate wash; phosphate wash; rinse;
chromic acid rinse; dry



Customer: Aluminum screen manufacturer Problem: Final finish of aluminum shade screen Cycle: Wash; rinse; phosphate coat; rinse; chromic acid rinse; dry



Customer: Water heater manufacturer Problem: Preparation of water heater shells for synthetic enameling Cycle: Phosphate wash; rinse; chromic acid rinse; dry



Customer: Hardware manufacturer
Problem: Preparing hardware parts for painting

Cycle: Wash; rinse; phosphate coat; rinse; chromic acid rinse; dry



#### AMERICAN CHEMICAL PAINT COMPANY Ambler 19, Pa.

Detroit, Mich. Niles, Calif. • St. Joseph, Mo.

les, Calif. • Windsor, Ont.

New Chemical Horizons for Industry and Agriculture





While using the new unit, operator can concentrate on guiding the arc. Other variables are automatic. Wellman Engineering operator welds stiffeners on hoist drum (left)

## Submerged Arc Welding Gets Boost

Cost-cutting potential of the process is said to be improved by an updated version of the familiar Squirtwelder. Among other advantages: It's lighter and easier to use

A NEW type semiautomatic welder (the ML-3) promises to broaden the advantages of the submerged arc process. Lincoln Electric Co., Cleveland, says its welder has these advantages:

1. Welding speed is five times faster than that of a comparable iron powder electrode. (Ceiling is 70 ipm at 600 amperes.)

2. The device combines the features of automatic welding with manual guidance.

3. The unit has automatic, metered flux placement to protect weld metal.

4. The gun and control unit are portable.

Case History — Wellman Engineering Co., Cleveland, tried the equipment on a 7-ft cable drum for

a large hoist. In comparison with the cost of using stick electrodes, the firm estimates savings were 65 per cent.

Made of 1½-in. plate, the drum has a large hub and 1-in. stiffeners arranged like spokes in a wheel. Stiffeners are welded to the base plate with a ¾-in. fillet; hub and plate are joined by a continuous ⅓-in. fillet.

Hub and stiffeners are tackwelded and blocked up about 3 ft above the floor. The welder puts a continuous bead around each rib and back to the hub joint. (Current is 550 amperes, 37 volts; speed is 17 ipm.)

Total time for welding and cleaning 30 ft of weld is just under 30 minutes.

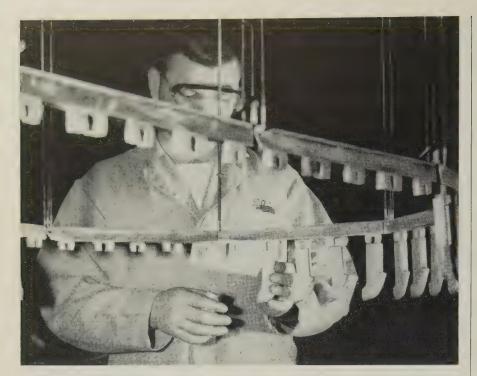
Description—Chris Ramsey, Wellman vice president, thinks the ML-3 is better than the old manual Squirtwelder. He feels its chief advantage is lightness, which reduces operator fatigue. It is limited to welding in the flat position.

The gun has automatic wire and flux feeds. It is moved along the weld by a small, variable speed motor which drives a knurled steel wheel. The operator only adjusts the speed and guides the gun.

The service unit sits on a wheeled base. It holds the wire spool, feed motor, and about 100 lb of flux. Dried, compressed air fluidizes the flux, carrying it freely through a hose to a reservoir on the gun nozzle. In use, flux flows by gravity to the weld.

The device doesn't require fixtures and operates easily on curves and some contours. It will operate on a standard direct current source with a capacity of 1000 amperes.

Cost is under \$1000.



Operator attaches a Carboloy mining tool to an Alnico magnet. This size grips up to 8 ounces. After dipping tools in lacquer, conveyor carries them to dryer and packing room

## **Magnets Cut Conveyor Costs**

They solve the problem of handling awkward shapes or those with no projections to grip. Size is no problem. Here's how GE applies them to a paint line

HAVE you ever faced the problem of hanging an "impossible" tool on a conveyor?

Magnets solved such a problem for the Metallurgical Products Dept., General Electric Co., Detroit. Its engineers estimate that savings in conveyor construction came to more than \$3500. (That's based on a magnet cost of 80 cents and doesn't include reduced maintenance.)

Construction—GE couldn't conveniently attach its Carboloy mining tools to a conveyor for painting. They come in more than 30 sizes and shapes.

The solution started with the conveyor backbone—it's made from 90 channel bars 12 in. long. They are joined by hinges and suspended from an overhead rail.

Five Alnico V magnets hang freely

from each bar. Like poles are placed adjacent to keep them from grabbing each other. GE chose a 1-ounce size which can hold 8-ounce tools. (For special jobs, it uses a 2-ounce magnet which can hold 2 lb.)

Sequence — After inspection, unpainted tools are taken to an overhead conveyor and attached to the magnets. As the line moves, it dips the parts into an aluminum lacquer bath. Farther on, compressed air and circulating hot air dry them.

Tools are removed by hand, inspected, and packaged.

After the tools are removed, the line passes through a hot alkaline solution to strip the lacquer from the magnets. A final hot water rinse completes the cycle.

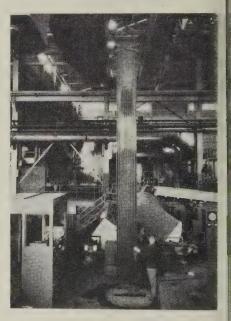
## Advance in Copper

Cakes 25 ft long, 36 in. wide are cast continuously. Added benefit: Better quality

COPPER rolling mills have a new way to increase operating efficiency and reduce costs: They can roll more copper per hour with the longer cakes (up to 25 ft long and weighing more than 17,000 lb) now available from American Smelting & Refining Co., Perth Amboy, N. J.

Added advantage: The company is using its new continuous casting operation to produce the cakes. They are sound, dense, and have a uniform surface.

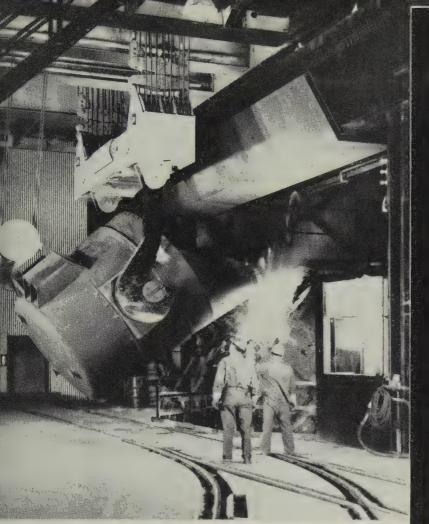
The Process—The technique eliminates batch casting in individual metal molds. It uses a "bottomless" water-cooled graphite mold that is positioned over a hydraulic lift in a pit.



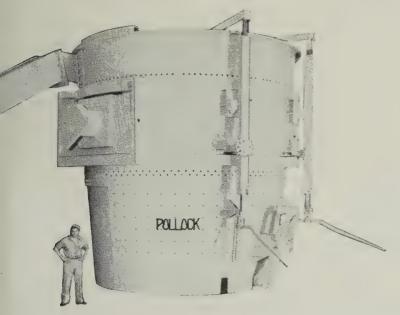
COPPER CAKE
. . . is pulled from mold by crane

Molten copper is poured continuously into the mold, is cooled rapidly, and solidifies as it passes through the mold. The lift goes down as more metal comes in. When casting is completed, the lift pushes the cake out where it's picked up by a crane.

At present, the process is being used to cast tough-pitch copper. With modification, it can be used to produce cakes of oxygen-free, phosphorized, or other special coppers.



ton capacity Pollock ladle pouring iron charge into one of the basic oxygen furnaces at the Aliquippa Works Division of Jones aughlin Steel Corporation.

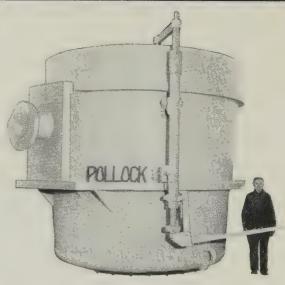


385-ton capacity open hearth ladle built by Pollock is the world's largest. It stands 17 $^{\rm I}$  3- $^{\rm I}$  $^{\rm I}$  tall.

## The Industry's STANDARD

## PALLACK LADLES

Pollock ladles, like the one at left, are engineered for the jobs they do. This one was engineered and built for the Jones & Laughlin Steel Corporation, Aliquippa Works Division, to transport molten iron from the mixer ladle to the new basic oxygen process furnace. Its integral spout eliminates the old-fashioned runner used in most pouring operations, and the feet mounted on the ladle base make the ladle free standing. Pollock also built the ladles to receive the steel from the new furnaces. When you plan new facilities or increased capacity in your present plant, consult the Pollock engineers about your ladles. They'll work with you to develop new highs in efficiency and safety.



100-ton capacity all-welded electric furnace ladle by Pollock. All-welded construction cuts ladle weight—increases payload.

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

ASSOCIATED IN GREAT BRITAIN WITH ASHMORE, BENSON, PEASE & CO.

STEEL PLATE CONSTRUCTION . ENGINEERS . FABRICATORS . ERECTORS





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... put a whole garden in a greenhouse? . . . enclose a swimming pool? Try an inexpensive geodesic dome of translucent plastic and "care-free" aluminum. They're miraculously strong, yet have no central supports.

Aluminam is ideal in so many roles that a steady flow of this metal is now essential to our economy. Fortunately

neighboring Canada is one of the world's most dependable sources of aluminum. Why? Because in Canada's river-rich northland over 1½ million kilowatts of hydroelectric power have been harnessed solely for aluminum smelting, an electrolytic process con-

suming over 18,000 kw hours per ton. The world's second largest producer of aluminum ingot, Aluminium Limited,

sells no consumer products in the United States. It concentrates, instead, on supplying hundreds of independent U.S. fabricators with a steady, dependable flow of raw material essential to business, to industry and defense.

Aluminium Limited, Montreal: Canada's independent producer of aluminum ingot for



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This portable shelter contains two essential ingredients: aluminum's lightweight strength . . . and skilled design engineering. Are you making the most of aluminum's unique properties in your manufacturing operations?

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### Controls Up Output

Static control logic elements reduce maintenance downtime on an assembly machine

STATIC CONTROL is expected to bring about a 10 to 15 per cent increase in production on a sparkplug assembly machine at General Motors' AC Spark Plug Div. plant, Flint, Mich. The secret: Reduced downtime.

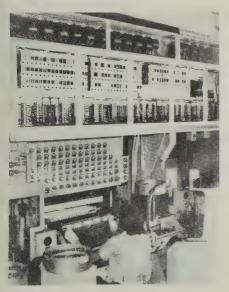
"With conventional controls, downtime on a machine begins after about a year of operation. After a year and a half to two years, all controls have to be replaced," state AC engineers. "We expect to avoid this problem with static controls," they explain.

Others Planned—The plant now has three different static control panels in use, and other panels are being designed for machines on which maintenance of conventional controls has posed a problem.

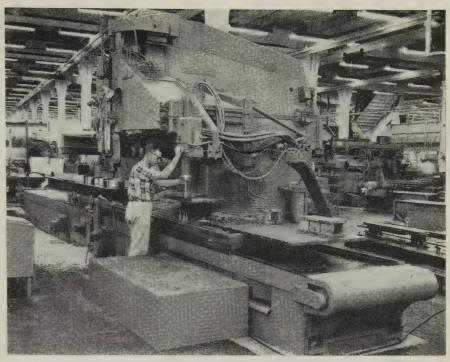
Built by Helfrecht Machine Co., Saginaw, Mich., the sparkplug assembly machine uses a control panel composed of 127 General Electric static control logic elements.

Static elements have no moving parts. Life expectancy is long because the parts are not subject to wear and erosion.

A quick and accurate means of checking machine operation is provided by monitor light attached to the plug-in elements. The plug-in design makes maintenance simple.



Operator loads base and ceramic cores on sparkplug assembly machine. Static control panel with logic elements can be seen on top of machine



This is one of the Cincinnati Hydro-Tel mills Martin recently installed. Table size is 45 by 208 in. Tracer guides cutter automatically. Used for aluminum, machine also handles steel

## Mill Handles Big Plane Parts

Increasing size of aircraft creates need for larger production equipment, says planemaker. Several mills like the one above make parts for Martin's P6M Seamaster

THE size of today's aircraft often forces planemakers to install larger equipment, says Martin Co., Baltimore.

It points to its own example: Several Cincinnati Hydro-Tel mills like the one in the illustration were recently installed. They are said to be among the largest in this

The machines automatically mill aluminum details for the Martin P6M Seamaster. They can also machine steel.

Feature—The head of one of the machines has a variable angle cutter which can operate at 20 rather than 90 degrees, the conventional setting. It is said to be the first machine so equipped.

A tracer control improves accuracy and efficiency. It can be

adjusted for tolerances of as little as 0.005 in.

Description — The tables will travel longitudinally 168 in. Crossram travel is 48 in. Tables are 45 by 208 in., with a maximum throat of 60 in. Vertical spindle travel is 24 in. There are 20 speeds, ranging from 16 to 1600 rpm.

The bed table unit has a rack and double pinion feed box. Feed rates for table and cross slide are infinitely variable from 1 to 25 ipm for tracing cuts and up to 50 ipm for straight milling cuts.

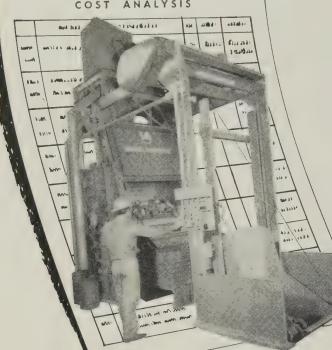
The table and cross slide can be rapidly traversed at 120 ipm.

Need—Such equipment, Martin points out, provides greater latitude of design and lightens aircraft construction. Combining several parts into a single machining eliminates fasteners, rivets, and gussets.

## Are You Paying for Blast Equipment

## You Don't Have?

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At Canton Malleable Iron Company two standard blast mills were operated two full shifts daily, requiring 32 man-hours of operator time. A Super Tumblast now does the same volume of work in only 10 man-hours. Castings formerly requiring 30 to 45 minutes are now cleaned in 9 minutes.





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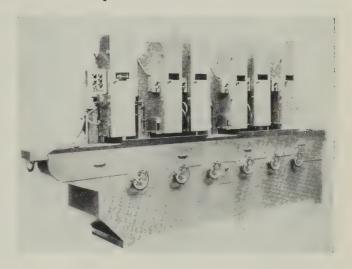
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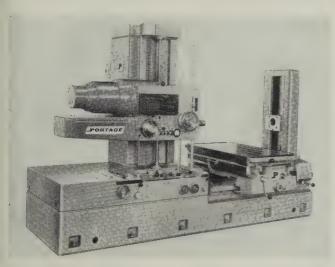
#### Conveyor-Type Belt Grinder Does Six Operations in One Pass

Model 680-6 abrasive belt unit handles high volume flat surfacing on ferrous and nonferrous metals, and other materials. It is equipped with six adjustable grinding heads. By using a series of abrasive belts, parts can be rough ground, sized, and finished to a fine finish in one continuous operation. For parts requiring heavy stock removal, identical belts can be used on each head to multiply the production rate. The unit is designed for both wet and dry grinding.

Maximum piece capacity is 5 in. high,  $5\frac{1}{2}$  in. wide, and any length. The conveyor belt is 7 in. wide and 268 in. long. Its speed is from 2 to 25 ft per minute. The unit contains two coolant pumps. The grinding heads have  $7\frac{1}{2}$ -hp drive units. *Write*: Engelberg Huller Co., 831 W. Fayette St., Syracuse 4, N. Y. *Phone*: Granite 8-3195



#### Horizontal Boring Mill Built for Economical Work



This milling, drilling, and boring machine is suitable for tool production, or roughing work. It features fast positioning and handling for long or short run lots. Power, spindle, and variable feed provide the best combinations for operations with large or small cutting tools

Separate spindle drive and feed motors offer maximum power to cutting tools at all speeds and provide flexibility of feed motions for economical tooling. Saddle feed range is from 0.03 to 30 ipm.

Spindle diameter is 3 in., and feed travel is 24 in. Spindle speed range is from 26 to 1535 rpm. The rapid traverse on head, table, and saddle is 90 ipm. Over-all dimensions are 10 ft 7 in. by 4 ft 8 in. by 7 ft 2 in. Write: Portage Machine Co., 1025 Sweitzer Ave., Akron 11, Ohio. Phone: Blackstone 3-7191

#### Transfer Units Automate Standard Punch Press Lines

These standardized Press-Matic units automatically load and unload parts in and out of dies and transfer parts between presses.

The machines are portable, floor type, and self-contained. They are equipped with quick air and electrical connectors.

The units are placed behind or in front of standard presses. They can move parts in or out of several dies on the same press. Dies can be unloaded on the upstroke of a press and reloaded on the downstroke for maximum production. Tooling can be adjusted to handle different parts on the same line.

Electrical interlocks and built-in safety features prevent the machines from completing a cycle if a die fails to release a part. Write: Die & Automation Inc., 5353 Dixie Highway, Hamilton, Ohio. Phone: Twinbrook 2-4581



April 7, 1958

## PRODUCTS and equipment

#### **Blade Milling Cutters**

This new line of inserted, high speed steel, blade milling cutters features generous size blades and ample length for deep shoulder cutting operations. These features permit economical grinding of radiuses on blades of the sizes normally encountered in light metal machining.

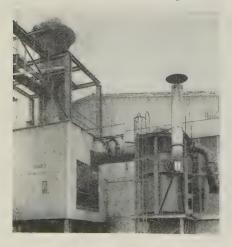


Chip spaces are polished to facilitate chip flow. The cutters are available with either a No. 50 NS drive for mounting the cutter directly to the machine spindle or a flat back drive for mounting on centering plugs.

Cutters are made to order with diameters ranging from 8 to 16 in. Width remains constant at 2 in. Write: Goddard & Goddard Co., 12280 Burt Rd., Detroit 23, Mich. Phone: Kenwood 1-3000

#### Improves Cupola Heating

This line of all metallic, hot blast preheaters for foundries lowers initial investment and maintenance costs by eliminating refractory materials. The unit makes possible



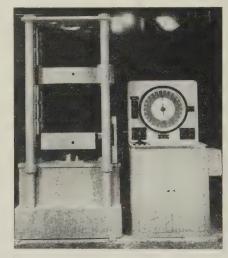
higher pouring temperatures, fast heatup, and smaller coke demand in the cupola.

The preheater burner is automatically controlled, operates on gas or oil, and is equipped with a combustion air blower. The heater is of a modular design; any number of units can be interconnected to increase capacity. Write: Brown Thermal Development Co., subsidiary of Brown Fintube Co., Elyria, Ohio. Phone: Fairfax 3-3291

#### **Testing Machine**

This large, single screw mechanical tester can apply tension and compression or alternating loads to the unit under test. The machine features positive head positioning, constant or variable head speed, direct reversibility for tension or compression, and the ability to cycle both load and strain.

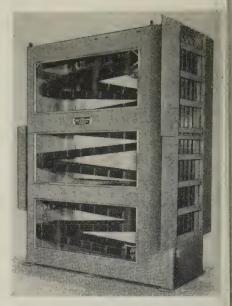
Because of a single preloaded ball and screw mechanism, drive power needed is less than ordinary: The machine is powered by a 5-hp motor. Standard testing space is 30



by 48 in. Load range is from 30 to 150,000 lb. *Write*: Electronics and Instrumentation Div., Baldwin-Lima-Hamilton Corp., Waltham 54, Mass. *Phone*: Twinbrook 4-6700

#### Feeder Counts Parts

This demand feed storage unit, designed for use in automated processing lines, handles rolling parts. It is constructed of ½-in. steel welded into a combination frame and shell. Tracks and elbows are made from die-stamped steel. A bypass track permits direct passage of parts through the unit.



Capacity ranges from 1500 parts  $2^{1}/_{8}$  in. in diameter by  $1^{1}/_{8}$  in. wide to 3000 parts  $1^{3}/_{8}$  in. in diameter by  $1^{1}/_{8}$  in. wide. Built-in counters provide a running inventory. Total weight is 4000 lb and floor space required is 3 by 8 ft. *Write*: Gear-O-Mation Div., Michigan Tool Co., 7173 E. McNichols Rd., Detroit 12. Mich. *Phone*: Twinbrook 1-3111

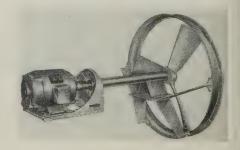
#### **Graphite-Silicone Paint**

Parts coated with this paint (black or aluminum) can be heated to 1000° F and dropped into icy water without danger of the paint cracking, peeling, flaking, or bubbling. It is called Thermocone. Write: Joseph Dixon Crucible Co., 167 Wayne St., Jersey City 3, N. J. Phone: Delaware 3-3000

#### Fan Shaft Lengthened

This line of axial flow extension shaft fans is designed for installations requiring isolation of the fan motor from the air stream. For corrosive exhausts, special corrosion resistant coatings for the fan and extension tubes are applied at the factory.

Type CE fans are available in multiblade designs made of cast alu-



Here at The House of Stainless, we provide a metallurgical service that goes far beyond helping you select the type of stainless best suited to your application.

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Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874 Sales Representatives at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Davenport, Iowa; Grand Rapids, Michigan; Minneapolis, Minnesota; Appleton, Wisconsin.

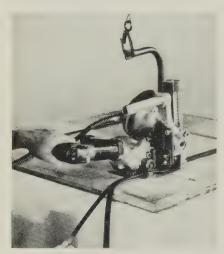
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## PRODUCTS and equipment

minum-magnesium alloy with diameters to 60 in. and air deliveries to 79,000 cfm. Extension shafts range from 16 to 66 in. in length. Write: Propellair Div., Robbins & Myers Inc., Springfield, Ohio. Phone: Fairfax 3-6461

#### **Power Strapping Tool**

The A4 pneumatic Steelstrapper combines tensioning, sealing, and cutting. The unit will work in any position. Tension is adjustable. The unit must go through its complete cycle before it will cut the strap. The power sealing lever is in the handle. Feed is from a magazine that holds 100 seals.



Models are available that handle strapping from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. wide. All units will handle straps ranging from 0.015 to 0.023 in. *Write*: Acme Steel Co., 135th Street and Perry Avenue, Chicago 27, Ill. *Phone*: Interocean 8-9500

#### **Prevents Metal Contacts**

This lubricant and rust preventive eliminates or reduces sticking and toxic fumes. It stays on the metal, insuring complete lubrication.

It can be used in diecasting, forging, drawing, and stamping in the place of oils, grease, graphite, silicones, and white lead. It doesn't clog spray systems, affect metal, or personnel.

It remains on work surfaces up to 3000° F and can be removed with water, alkaline solutions, or solvents. Main ingredients: Extreme pressure lubricants plus metal in soluble

form. It does not contain silicones, manganese, copper, graphite, or suspended matter. *Write*: Harry Miller Corp., Fourth and Bristol Streets, Philadelphia 40, Pa. *Phone*: Davenport 4-4000

#### **Power Turntable**

Telescoping legs permit the top of this table to be adjusted from 24 to 39 in. above the floor. It is supported at four points by 6-in. di-



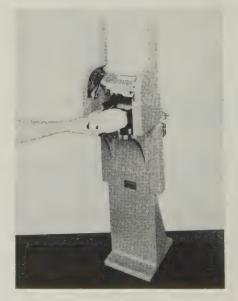
ameter, rubber tired wheels. Available in diameters of 4, 5, and 6 ft, it can be positioned to allow up to 180 degrees of transfer.

The two larger tables are  $\frac{1}{4}$ -in. steel, die formed plate. The 4-ft unit is 3/16-in. plate. *Write*: Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

#### Color Filling, Printing

Acroprinter, Model 401-A, applies color to depressed or sunken cavity letters and designs. It also applies color to raised panels, faces of raised letters and designs, or combinations. Impression controls are automatic.

It is a platen type printing machine mounted 32 in. above the floor. With cast iron base, it weighs



135 lb. Three sizes are available. Write: Acromark Co., 398 Morrell St., Elizabeth, N. J. Phone: Elizabeth 2-6500

#### Coating Tough, but Flexible

Charcote CIC "21," a corrosion inhibiting coating, uses a Du Pont Neoprene base, has a built-in primer. Features are economy; ease of application; resistance to weathering, chemical fumes, salt spray, and corrosion creep. It has a hard, tough, yet flexible film that resists impact and abrasion. It adheres to steel, bronze, aluminum, stainless steel, and galvanized iron. Write: Charleston Rubber Co., Stark Industrial Park, Charleston, S. C. Phone: Sherwood 4-7434

#### Air Cushion Saves Nozzle

Two power sources are required for this line of trolley lubricators: An air line, and the moving conveyor. Spacing of conveyor trolleys



may be inches or yards apart. A built-in air cushion allows a bent trolley to pass without breaking the nozzle.

Automatic lubricators are available in eight different models for either oil or grease. Write: Olsen Mfg. Co., 638 S. Rochester Rd., Clawson, Mich. Phone: Lincoln 4-8338

#### Miller Is Automatic

Wardwell No. 100F saw tooth milling and grinding machine is hydraulically operated. This unit automatically performs multiple operations.

It indexes a gang of saws (up to 14 in. in diameter and in gangs up to 7 in. long), one row of teeth at a time. It will take 112 saws, 1/16

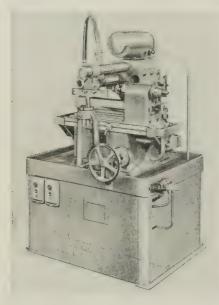
## Apply your special requirements to basic R. D. Wood press designs

Here's the sensible, economical way to design your own press. Working with numerous basic models, R. D. Wood engineers apply your specifications and modifications to produce the press precisely suited to your needs. No starting from scratch. No needless delays in construction. No paying for more design than you need. You're sure of quality too. For every Wood press is constructed of selected materials by master craftsmen. Here is your assurance of precise operation and long, trouble-free performance. When you need a press, bring your specifications to Wood.

R. D. Wood Hydrostatic Tube Testing Machine for tubes of 4½" to 12" diameter nominal sizes and in maximum lengths of 35'-0" at hydrostatic test pressures from 700 to 1500 psi. Resistance head can be adjusted for testing shorter lengths. Unit is completely self-contained. The tube tester is fitted with all necessary fittings and accessories. One man operates it. Write today for catalog and engineering information.



## PRODUCTS and equipment



in. thick, in one setting. *Write*: Wardwell Mfg. Co., 3805 Ridge Rd., Cleveland 9, Ohio. *Phone*: Melrose 1-3164

#### **Electronic Counters**

Model C Count-Pak is a complete unit consisting of a high speed magnetic counter in a case, combined with a light source and a photocell.



The photocell is small and can be made in any configuration needed. Cell and light sources are permanently assembled so that vibration will not jar them out of focus.

Pulses as short as 0.0002 second will actuate the device. Rated speed is 3000 counts a minute with reasonable accuracy. Write: Electronic Controls Div., Veeder-Root Inc., Hartford 2, Conn. Phone: Jackson 7-7201

#### Feeds Parts Faster

These bowl type part feeders come in a range of sizes from 5 to 36 in. in diameter. They are available in cast aluminum, cascade or straight wall fabricated stainless, or coldrolled steel. Bowls are of a quick-



change design for users who interchange bowls to handle different parts on the same drive units. *Write*: Syntron Co., 370 Lexington Ave., Homer City, Pa. *Phone*: 9-8011

#### **Power Table**

This unit is power elevated for fast up and down movement.



One lever controls all table movements and lowers, raises, and locks the table in place. Limit switches control top and bottom travel limits. A gear motor provides the power. *Write*: Edlund Machinery Co., 44 Huntington St., Cortland, N. Y.

#### **Punch Press**

No. 4-B is a 40 ton, double crank, open back, inclinable press. It features extra large die area and an



electrically controlled, air operated, friction clutch.

The bed area is 16 by 48 in.; face of ram, 14 by 36 in.; die space, 12 in.; clearance between housings, 3 ft. Write: Service Machine Co., 2310 W. 78th St., Chicago, Ill. Phone: Prospect 8-1200

#### Portable Electroplater

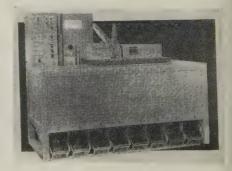
This compact unit for precision plating measures 34 by 28 by 33 in. It permits mass production barrel or rack plating with any cold alkaline solution, and most acid plating solutions.



The units are completely automatic. In operation, the solution is continuously drawn off at the bottom of the tank, circulated through the pump and built-in filter, and returned to the tank under pressure. Write: Sel-Rex Corp., Nutley, N. J. Phone: Nutley 2-5200

#### **Gear Inspection Unit**

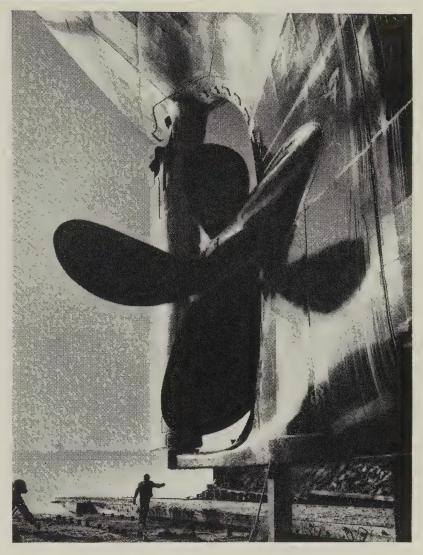
This machine automatically gages, sorts, and counts gears and nongear parts into eight size categories at up to 1200 parts an hour. Gaging limits are easily and accurately changed and production speed is adjustable. The unit operates on





Heavy sections like rudder posts and propeller blades can be gamma ray inspected with ¼ shorter exposure—and welded seams can be radiographed more rapidly with available portable or low kv x-ray equipment—when Kodak Industrial X-ray Film Type KK is used.

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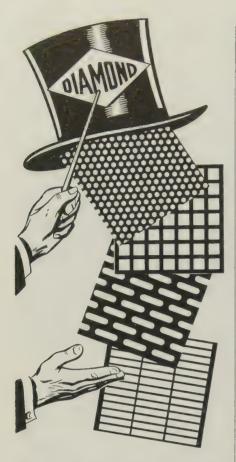
This film shows as much as 50% increase in speed over the well-known Type K Film. It means more work can be done—that exposures can be cut by

a third. And those who have tried Type KK tell us that its higher contrast, offsetting a slight increase in graininess, provides improved radiographic sensitivity.

To learn how Kodak Industrial X-ray Film Type KK can extend the service of your present radiographic equipment, get in touch with your x-ray dealer or Kodak Technical Representative.

EASTMAN KODAK COMPANY X-ray Division, Rochester 4, N.Y.

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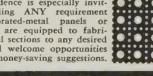


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The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.

Catalog 39 also illustrates and describes our high-quality lines of Ornamental Cane, Perforated-Metal Sheets for Accoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.

Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.



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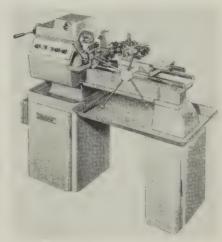
Manufacturers of DIAMONTEX, the Perforated Metal Lay-In panel for better Acoustical Ceilings. New Bulletin No. 47, gives complete information. Write, today, for free copy.

#### PRODUCTS and equipment

110 volts and 70 psi air pressure. Write: Garrison Machine Works Inc., 515-525 Bannock St., Dayton 4. Ohio. Phone: Hemlock 6708

#### **Turret Lathe**

This high speed unit is designed for secondary operations and production jobs. It features modern styling and controls, 13-in. swing over the bed ways, and a 1 1/6-in. collet. The six-station ram turret handles up to 1 in. shank tools.



Spindle speeds (40 to 2000 rpm) are selected by fast-slow pushbutton controls and read on the headstock tachometer. Write: Sheldon Machine Co. Inc., 4258 N. Knox Ave., Chicago 41, Ill. Phone: Mulberry 5-1970

#### Air Impact Wrenches

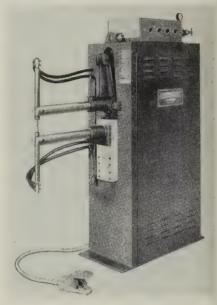
The J-40 series of 3/8-in. units are available in side throttle handle or lever throttle types. Units have direct drive (no gearing). Power is furnished by a high speed, six-bladed, air motor.



The mechanism has only two impacting members, and they can be turned over for longer life. Write: Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 32, Ohio. Phone: Redwood 1-8888

#### Rocker Arm Spotwelder

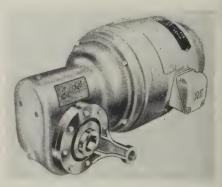
These SR O welders are available in standard O size frames, with a 30 or 50 kva transformer. Throat depth is varied from 12 to 42 in. by choice of arm lengths. The unit



is for general purpose uses where relatively light gage metals are fabricated. Write: Dept. SR O, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill. Phone: Portsmouth 7-5600

#### Gear Motor

This right-angle unit features a hollow shaft that permits direct coupling to equipment merely by inserting the driveshaft.



Units available have ½ to 2 hp motors and 13 gear reduction ratios from 18 to 250 rpm. Write: Reuland Electric Co., Alhambra, Calif. Phone: Cumberland 3-4171

## Titerature

Write directly to the company for a copy

#### Combustible Gas Analyzer

No. 1703-4, an 8-page bulletin, presents three basic instrumentation systems for centralized control, including remote equipment usable at high temperatures. Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.

#### Double Column Bedmill

Bulletin 2866 describes a unit with hydraulic tracer control which handles production profiling, die and mold making, scanning, and duplicating. George Gorton Machine Co., Racine, Wis.

#### **Platinum Products**

This brochure describes company products, special products, and services available. Tables and charts on standard alloys and platinum are included.

In addition, several pages are devoted to general information, useful for reference: Physical properties of the elements, comparative lengths, areas, volumes, and weights. J. Bishop & Co. Platinum Works, Malvern, Pa.

#### Rare Earths and Metallurgy

This publication contains abstracts of a ten-year survey of world literature on "Metallurgical Applications of the Rare Earths," ferrous and nonferrous. Davison Chemical Co., P. O. Box 488, Pompton Plains, N. J.

#### Cold Roll Forming

This 88-page reference manual discusses the economics, mechanics, and applications of cold roll forming. Included are descriptions and complete "how to" instructions on special operations. Yoder Co., 5500 Walworth Ave., Cleveland 2, Ohio.

#### **Grinding Wheels**

The "Snagging Handbook" is a manual of specifications, handling and maintenance information, and safety precautions. A "How To Establish Grinding Costs" chapter is included. Peninsular Grinding Wheel Sales Corp., 729 Meldrum Ave., Detroit 7, Mich.

#### Catalogs

No. 1000, 36 pages, covers charts and procedures for Thomas suspension insulators, and clamps and fittings. No. 1050, 8 pages, contains charts and information on the selection of suspension and strain clamps for conductors and construction characteristics of conductors. Delta-Star Electric Div., H. K. Porter Company Inc., Lisbon, Ohio.

#### **Ductile Iron Castings**

MPC, a 12-page bulletin, lists applications of ductile iron for machine parts. Included are material specifications and foundry facilities available for production to meet specific requirements. Cooper-Bessemer Corp., Mt. Vernon, Ohio,

#### Chemical Coatings

Bulletin 1424-A describes protective and prepaint coating chemicals for aluminum. Advantages, methods of application, equipment used, and type products treated are included. American Chemical Paint Co., Ambler 1, Pa.

#### **Marking Machines**

This 8-page catalog describes standard marking machines. Included are specifica-

tions and service and technical information. Markem Machine Co., Keene 43, N. H.

#### Stainless Tubing

Technical Data Card 148A summarizes hot working, annealing, welding, and forming data on 24 stainless tubing steels. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

#### Rubber Parts

This chart lists the standards and characteristics of molded products, cut parts, rubber covered rolls, punched and extruded parts in natural rubber, Neoprene, Buna N, GR-S, Thiokol, and Butyl. Williams-Bowman Rubber Co., 1945 S. 54th Ave., Cicero 50, Ill.

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This 10-ton cab-operated Cranemaster is the first of two in service for Continental Can Co. Like so many other

manufacturers, Continental Can Co. found Cranemasters the top initial value... with lasting satisfaction assured by Abell-Howe's years of experience in building overhead handling equipment that better fills the bill for industry of all kinds.

CAPACITIES TO 15 TONS
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FOR BETTER CONTROL OF COSTS!

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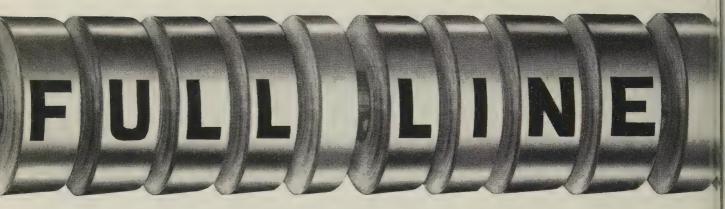


Forest Park, Illinois

a wide selection ..



restricted and standard specification cold rolled strip steel



at J&L.

Let's examine this "Full Line" product list of cold rolled strip steel. At J&L it includes all carbon grades, coated and uncoated, alloy, stainless and tempered spring steel. It offers all thicknesses from .001" or less to .156" or more, in widths from 1/4" to 24"—and tolerances for gauge and width closer than standard when required. There are "Full Line" advantages, too, in a range of controlled tempers and structures possible only with the variety of annealing,

Your "Full Line" benefits can start by specifying J&L because only J&L makes standard and restricted specification cold rolled strip steel in such a wide range of analyses, grades and sizes to accurately meet the most exacting need.

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For Strip Steel, call the Strip Steel Specialist — J&L.

J&L STRIP STEEL DIVISION produces a full line of restricted and standard specification strip steel in these grades and types:

> Low Carbon **High Carbon Tempered Spring Steel** Molten Zinc Coated (Jalzinc) **Electrolytic Zinc, Tin, Copper** and Brass Coated Alloy **Stainless Painted**



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FORMERLY THE COLD METAL PRODUCTS COMPANY

April 7, 1958

Outlook

ALTHOUGH cutbacks in steel production suggest that we haven't hit bottom yet, there's room for guarded optimism. Steel's quarterly survey of component inventories (Page 137) shows that buyers have worked their stocks down to the level of current consumption. They aren't likely to build inventories during the second quarter, but at least they'll buy for replacement.

The effect won't be felt immediately, of course, since inventories are backed up all along the line. Manufacturers of parts have big stocks of finished goods, and mills have plenty of semifinished steel.

In a generally sagging market, construction, shipbuilding, and canning are the leaders.

**CONSTRUCTION PICKS UP—** As work on the St. Lawrence Seaway moves into high gear, New York's power authority is asking for bids on 94,500 tons of reinforcing bars for May delivery. Indiana's highway contracts for April are equivalent to more than half the road building authorized by the state during all of 1957. Illinois also plans to increase its highway program.

**TIN PLATE LEADS**— With canmakers talking of a record year, tin plate continues to top all other products in demand. Operations are running at 80 per cent of capacity or better. Soft drinks are the special stimulant, but good food packs are expected this summer.

RAILROAD ORDERS—Adding strength to an otherwise depressed market, the Chicago, Milwaukee, St. Paul & Pacific Railroad Co. is taking bids on Apr. 17 for \$12 million worth of equipment. Scheduled for fall delivery are 1000 steel-boxcars and 150 hoppers. Last year, the company spent \$11.8 million for freight cars.

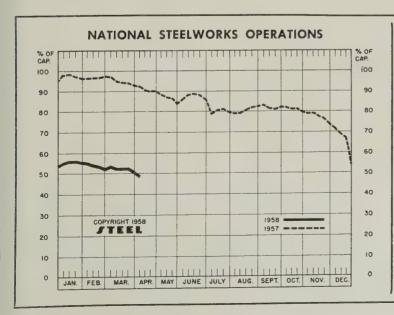
APPLIANCE LAYOFFS— Less encouraging is

the news that two large makers of household appliances are planning production cutbacks. Tomorrow, Frigidaire Div. of General Motors Corp. will lay off more than 1100 employees at Dayton, Ohio, "to keep inventories in line with the sales outlook." The Columbus, Ohio, plant of Westinghouse Electric Corp. was also closed this week. Nevertheless, demand for low silicon sheets (which go into fractional horsepower motors) is improving slightly—a sign that motor manufacturers still are confident about one of their major customer groups, appliance makers.

**PRODUCTION SKIDS**— Because of sharply curtailed automotive buying and less-than-normal upturns for other big consumers, steelmakers are still cutting production. Last week, cutbacks and the observance of Good Friday caused steelmaking operations to drop two points to 48.5 per cent of capacity. Production was 1,298,000 net tons of steel for ingots and castings.

**PRICE CUTTING?**— As the sales squeeze continues in the automotive industry, there's talk of price cutting at the mill level. For a percentage of commitments, one mill reportedly is invoicing customers at published mill prices, later issuing them credits which serve as discounts on future orders. A tool steel producer reports that customers are suggesting that he trim prices, extend terms, and provide a warehouse service.

**SELLS PUBLIC ON STEEL**— U. S. Steel Corp. is going straight to the consumer in an effort to lift sales out of the doldrums. Its "new look" merchandising program (new theme, trademark, and labels) is designed to "hold and extend the preference of the general public for products of steel" over competitive materials.



#### DISTRICT INGOT RATES

(Percentage of	of Capa	icity En	gaged)	
₩e	ek Ende	ď	Same	Week
	Арг. 6	Change	1957	1956
Pittsburgh	53.5	→ 2.0*	95	100
Chicago	53.0	- 0.5	87	100.5
Mid-Atlantic	49.0	- 2.0	95	98
Youngstown	45.0	- 2.0	89	103
Wheeling	67.5	<b>—</b> 5.0	90	96.5
Cleveland	32.0	0*	93.5	93.5
Buffalo	37.0	0	98	105
Birmingham	47.5	0	97	93
New England	48.0	- 4.0	65	85
Cincinnati	44.0	-11.0*	69.5	89
St. Louis	70.0	0	101	95
Detroit	22.0	→ 6.0	95.5	95.5
Western	63.0	- 4.0	104	104
National Rate	48.5	- 2.0	92.5	99.5

#### **INGOT PRODUCTION**‡

	ek Ended Apr. 6	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	80.8†	85.0	88.7	144.4
NET TONS (In thousands)	1,298†	1,366	1,425	2,319

\*Change from preceding week's revised rate. †Estimated. †American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

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This Industrial 10 ton magnet crane, another in the versatile Industrial line, operates both inside and outside the plant, even under severe operating conditions. Special sanders on the wheels give positive traction for smooth operation when runway is wet or icy. Full length truss type platform has decked walkways for convenient maintenance. Enclosed cab has full magnetic controls.

These Industrial features give you rugged dependability and low cost maintenance:

- Heavy duty MCB roller bearing bridge and trolley trucks.
- Precision machined components throughout.
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- Wide choice of electrical controls.
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TTEEL QUARTERLY SURVEY	CURRENT INVENTORIES			2nd Quarter FORECAST				
COMPONENTS	UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	LOWER	SAME	HIGHER
CASTINGS	4%	27%	45%	21%	3%	22%	64%	14%
OTHER FORMED COMPONENTS Forgings, stampings, springs, wire shapes.	3%	24%	39%	23%	11%	22%	61%	17%
MACHINED COMPONENTS	6%	28%	36%	22%	8%	22%	60%	18%
ELECTRICAL EQUIPMENT, MOTORS	17%	25%	36%	18%	4%	25%	65%	10%
FASTENERS	1%	24%	54%	14%	7%	24%	61%	15%
MECHANICAL RUBBER GOODS, BELTING	12%	20%	44%	22%	2%	17%	71%	12%

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR UNDERSCORED figures show how most respondents reported.

## Inventory Reduction Grinds to Halt

With stocks adjusted to current needs, component buyers will be back in the market this quarter. But they'll order only for replacement, barring an upturn

Steel's quarterly survey shows that buyers of industrial components have worked their stocks down to the level of current consumption.

As a Brooklyn steel products manufacturer puts it: "Our inventory is in just the position we would like to maintain. We have enough supplies on hand to keep up normal production."

No Buildup Ahead—Few component buyers are going to start building inventories during the second quarter. Caught with topheavy stocks when business dried up last year, they're in no mood to burden themselves unnecessarily. If they start building, it will be because the signs of a business upturn are unmistakable.

Even if they don't increase their inventories, buyers will be in the market for limited quantities of

parts. They'll order enough castings, forgings, stampings, bearings, gears, and other components to replace those that are being taken out of stock. Result: Partmakers can expect small orders for quick delivery during the second quarter.

Uncle Sam Steps In—In the few cases where survey respondents expect larger inventories, defense spending is a big factor. Says a midwestern manufacturer of electrical products: "We expect our inventories to be higher three months from now because of a large government contract and not because of a change in policy or an anticipated increase in normal production." A buyer for the ordnance division of a food machinery company adds: "An increase in our operating level makes for an increasing inventory."

In the last three surveys, the per-

centage of respondents predicting lower inventories has fallen while the percentage of those forecasting the same or higher stocks has gone up. In the previous survey (STEEL, Jan. 6, p. 485), the buyers voted 2 to 1 (26 per cent to 13 per cent) for lower inventories. Now the margin is only 3 to 2 (22 per cent to 15 per cent). A decided majority (63 per cent) expects no change in inventory level during the second quarter.

Last October, 69 per cent of the survey participants said their inventories were lower than they had been three months earlier. In January, 46 per cent reported that their stocks were below the October level. Today, 36 per cent have smaller inventories than they had in January. The figures add weight to the opinion that inventories are being stabilized.

Deliveries Good—The buyers are unanimous in reporting that deliveries are generally satisfactory. One purchasing agent calls them "too good." A few (7 per cent)—say they







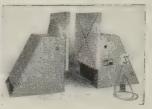
Aronson TrocTred (T.M. Reg.) Turning Rolls for thin-walled heavy cylindrical work to 27 tons capacity. Zero to 100 IPM turning speed and Built-In Grounding.



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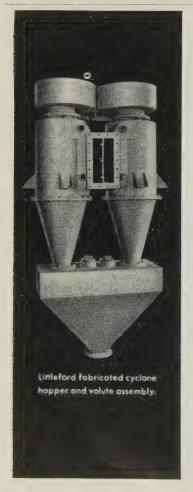


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LITTLEFORD BROS., Inc. 425 E. Pearl Street, Cincinnati 2, Ohio have trouble obtaining castings; 5 per cent have difficulty with forgings; 5 per cent with bearings. "Unground ball bearings require eight to ten weeks' leadtime," one man complains.

Most of the buyers favor 30 to 60 day inventories of the major components. Ten per cent say their stocks of castings are too heavy; 6 per cent have too many forgings; 6 per cent have too many bearings.

#### Stainless Steel . . .

Stainless Steel Prices, Page 150

Market observers are watching closely for price developments in the stainless market now that prices on aluminum are lower. It is competitive with stainless in many applications.

McLouth Steel Corp., Detroit, a large supplier to the automotive industry, is reported to have closed down its six electric furnaces to facilitate a construction program while demand is slow.

The Stainless Steel Div., Jones & Laughlin Steel Corp., Detroit, begins the manufacture of stainless steel wire next month. It will produce  $\frac{1}{8}$  to  $\frac{1}{2}$ -in. wire.

Wallingford Steel Co., Wallingford, Conn., last week announced it is now quoting 55.25 cents per pound on type 305, cold-rolled stainless strip and 81 cents per pound on type 316. The market on these grades has been 55 cents and 80.75 cents.

#### Sheets, Strip . . .

Sheet & Strip Prices, Pages 147 & 148

More fabricators who use sheets and strip are being caught in a cost-price squeeze. Competition for the declining volume of business is getting sharper. Some component prices which were marked up to cover the last increase in steel have given way.

Expectations are the steelmakers will be under increasing pressure for price concessions. Last week, a Detroit seller was offering to invoice customers at published mill prices, issuing credits which can be used as discounts when placing future orders. This is the first report of price cutting at the mill level, except for the recent lowering of extras on hot strip. If there is any hedge buying in anticipation of a midyear advance, it probably won't start until well along in this quarter.

Buyers are following a conservative policy in placing orders. There doesn't seem to be any fixed buying pattern, though. While little improvement is noted in April bookings, some business is reported coming through for May shipment, notably in New England. Demand from appliance makers is spotty, but one sheetmaker says its appliance sheet volume in the first quarter bettered that of a year ago. Growing interest in silicon sheets indicates a possible stirring in appliance needs.

Although many consumers have cut their inventories to the point they are dependent upon prompt shipment tonnage, inventories of some manufacturers continue high. Cutbacks in auto production have boosted automotive stocks into the 30 to 40 day level at many plants.

#### Steel Bars . . .

Bar Prices, Page 146

"We've noticed a little pickup in the last week, but March won't be any better than February. We see no improvement for the second quarter."

That comment of a Pittsburgh area producer of cold-drawn bars sums up the situation in the commercial steel bar market.

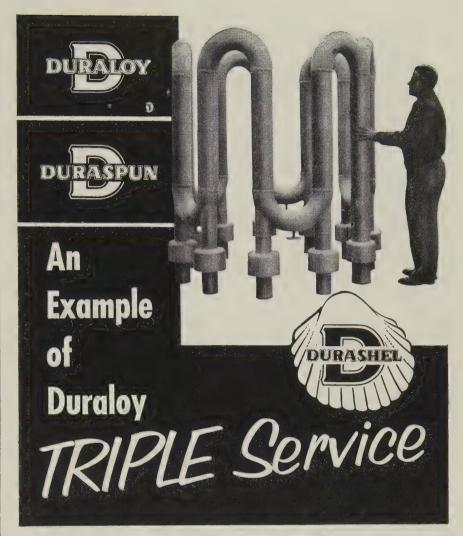
Demand is scarcely holding its own at most points of consumption. Pittsburgh producers say auto builders aren't buying more than 30 days ahead. They often schedule orders for one month and later ask that deliveries be held for the following month. Some orders are canceled.

Detroit area producers report continued lagging demand. They are hopeful of a pickup in April orders, but so far there are no favorable signs. Alloy bars appear to be particularly sluggish. One district seller says: "We're stocking so damn many sizes of bars we're nothing more than a king-sized warehouse right now!"

#### Tool Steel . . .

Tool Steel Prices, Page 150

A Pittsburgh producer of tool steels reports its March orders were 40 to 50 per cent above its February bookings. Buyers started coming back into the market in January, replacing stocks depleted in



This photograph of an 'immersion type radiant heater' shows a welded assembly of:

1-static castings (collars)

2—centrifugal castings (straight pipe sections)

3-shell molded castings (bends)

This unit provides an excellent example of our broad TRIPLE Service.

Our experience in static high alloy castings began in 1922; in centrifugal castings, in 1933; in shell molded castings, in 1955. Thus, in this radiant heater, the old blends with the new, It's an excellent example of the kind of work we do.

If you want your high alloy castings alloyed by specifically experienced metallurgists and cast by specifically experienced foundry men . . . those who work exclusively along these lines . . . Duraloy should be your choice.



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' April 7, 1958



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Tooling for the 1959 cars is underway, and some interests are concerned about foreign competition, particularly on the straight carbon material used in massive forming operations.

#### Wire . . .

Wire Prices, Pages 148 & 149

The slight stepup in requirements of welded highway and building mesh is not being matched by demand for manufacturers' wire, spring, heading, and other industrial grades. Merchant products are moving better as spring opens up, but the seasonal gains are still disappointing.

For months, buying of high carbon specialties has been slack in New England. Day-to-day bookings show only slight change. Producers anticipate improvement in the second half. Automotive support is not likely to be strong this quarter, and no substantial upturn is anticipated before late third quarter.

Rod inventories are reported to be generally heavier than stocks of finished wire products.

#### Pig Iron . . .

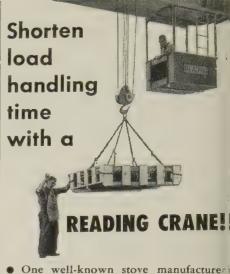
Pig Iron Prices, Page 151

With prompt shipment tonnage readily available, pig iron buyers are not ordering far ahead. Cleveland merchant iron sellers say March orders were fairly numerous, but total tonnage was small. They think April volume will about equal that of March, but they believe the buying pattern indicates that consumers' inventories have been pretty well liquidated.

First quarter iron shipments in New England were 20 to 25 per cent behind those in the like period last year. The decline was sharpest in the movement of tonnage to the gray iron shops; malleable foundry operations were a little better, but several companies are reducing their melts this month.

Foundry operators in upper New York are not optimistic about prospects for this quarter. One large district shop was closed by a strike. Reduced workweeks continue to be the rule, and many shops have laid off workers.

April demand for foundry iron in the Chicago district is expected



wanted to speed up assembly—a call to Reading engineers led to complete solution. A 10-ton, double I-Beam, cab-controlled Reading Crane brought even better results than expected.

Get complete information from our latest catalogs or ask a Reading engineer to analyze your handling operations... at no obligation.

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to equal March shipments, which were more than 10 per cent below expectations. Farm equipment foundries are busier than the general run of shops. Caterpillar Tractor Co., Peoria, Ill., resumed a fiveday week last Monday. The return to a normal work schedule ended ten weeks of curtailed output.

Operations of 24 to 32 hours are common for many jobbing shops in

the Midwest.

In New England, second quarter prices on pig are unchanged for contract customers of the Mystic Iron Works.

#### Tubular Goods . . . .

Tubular Goods Prices, Page 150

There are few signs of improved sales in tubular goods. Oil country tubing demand continues dull, but producers are hopeful of better volume this quarter as the weather improves.

The outlook for pressure tubing should brighten with expansion of the highway program and accompanying increased requirements for construction machinery. Tubing sales are at month-ago levels, Detroit sellers report. One area producer reportedly holds 1200 tons of steel in stock, but is scheduling only enough output to use up 300 tons.

Despite slackening orders from utilities and slowness in demand on chemical industry account, pressure tubing is moving better than mechanical tubing. April bookings for mechanical tubing are down. Warehouses are cutting orders.

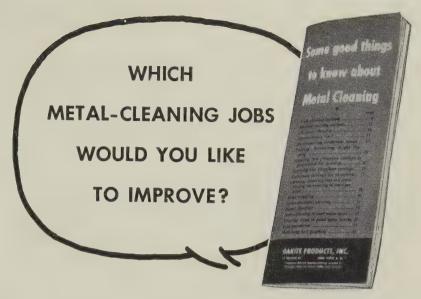
#### Plates . . .

#### Plate Prices, Page 146

Major consumers of heavy plates, such as builders of electrical equipment and mill machinery, are expected to be out of the market another month or two. Their inventories are still too large "for comfort," and they are feeling the effect of lagging demand for their products.

Reflecting the weakness in the plate market, a New York broker has been offering tonnage below the standard price in the Pittsburgh area. But local interests question the quality of the bargain plates.

A Pittsburgh producer says orders from the Caterpillar Tractor Co. (Please turn to Page 143)



- ¶ Are you cleaning metal in the most economical way? See page 9 of Oakite's FREE booklet on Metal Cleaning.
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  See page 31.
- ¶ How do you clean parts that are too large to be soaked in tanks or sprayed in machines? See page 31.
- $\P$  Are you getting full profit out of your finishing barrels? See page 32.
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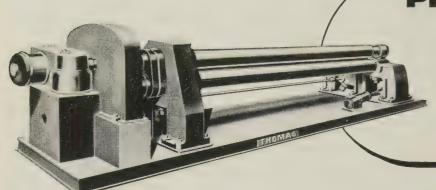


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#### PRODUCTION BENDING



#### **Plate Bending**

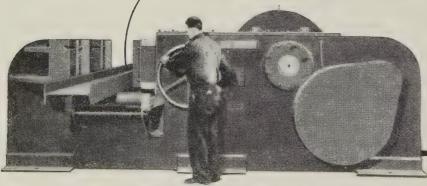
The Thomas line of Initial or Pinch Type Plate Rolls is comprised of twelve sizes of all steel machines completely modern in design. Features include enclosed drive running in oil; power adjustment and power drop-end.

#### **Angle Bending**

Thomas All Steel Angle Rolls are built in both vertical and horizontal styles, and capacity range is from  $2 \times 2 \times \frac{1}{4}$ " to  $6 \times 6 \times \frac{7}{6}$ " angles. Shapes other than angles may also be bent by using special rolls.



#### **Bending and Straightening**



Thomas All Steel Bending and Straightening Machines, for cold working of structurals; Bars; Billets; Rails and other shapes, — built in six sizes — from 50 to 400 tons.

The machines shown are but a few of the types Thomas builds. If you have an equipment problem which involves Bending, Shearing, Pressing or Punching call on us.



PITTSBURGH 23, PA.

(Concluded from Page 141)

are improving slightly now that that company has returned to a five-day week.

Demand is barely holding in New England. Fabricating shop operations are slower. The small tank business is showing something of a seasonal lift in activity, but needs are being met largely from inventory. Plate specialty volume is off.

U. S. Steel Corp. is planning major improvements for its wide plate manufacturing facilities in the Chicago district. Engineering work is underway. Progress report: Plate mill facility improvements in the Chicago district which were announced in 1956 are nearing completion.

#### Reinforcing Bars . . .

Reinforcing Bar Prices, Page 146

Thousands of tons of steel required for St. Lawrence Seaway construction are scheduled to be placed over the next couple months. Some 94,500 tons of reinforcing steel are involved in pending work. The New York State Power Authority closes on three contracts May 1, 6, and 20.

Reinforcing bars share with structural shapes and plates the increase in demand arising from expanding construction programs. Close to 5000 tons of bars are pending for substructure work on the new House building in Washington.

Wire fabric and reinforcing bar sales are moving along reasonably well as spring construction programs get going in the Detroit area. Orders that had originally been expected in March are appearing now. A sizable increase in volume is expected to show up next month.

Welded mesh for highways is more active than it was, but demand has not built up sufficiently to take up the increase in capacity completed in 1956-57. Rhode Island has a section calling for 645 tons.

At Cleveland, an office building will take 2000 tons of bars.

#### Warehouse . . .

Warehouse Prices, Page 151

While distributors are disappointed by March volume, business was slightly better than it was in February. Expectations are April

will see a continuance of the uptrend, with spring building requirements exerting a favorable influence.

Warehouse prices, in the main, are firm at most points. Philadelphia area sellers now quote hotrolled strip at \$8.67, carbon plates at \$8.75, and floor plates at \$9.75. They have also put new quantity extras into effect on all hot-rolled items.

#### Ferroalloys . . .

Ferroalloy Prices, Page 154

Electro Metallurgical Co., a division of Union Carbide Corp., New York, has increased the purity of its columbium metal to 99.6 per cent through reductions in oxygen and nitrogen content.

The new specifications are: Columbium, 99.6 per cent min; oxygen, 0.10 per cent max; nitrogen, 0.04 per cent max; carbon, 0.05 per cent max; tantalum, 0.15 per cent max; titanium, 0.01 per cent max; iron, 0.01 per cent max; silicon, 0.01

per cent max; boron, 0.0001 per cent max.

#### Iron Ore . . .

Iron Ore Prices, Page 152

Iron ore stocks on hand Mar. 1 totaled 57,795,051 gross tons, vs. 41,632,273 tons a year ago, reports the American Iron Ore Association.

The breakdown: U. S. Lake Superior ore, 39,152,167 tons, vs. 28,698,106 a year ago; other U. S. ores, 3,355,048, vs. 3,299,193 tons; Canadian Lake Superior ore, 1,377,650, vs. 1,411,823; other Canadian ores, 5,708,929, vs. 3,910,313 tons; foreign ores (other than Canada), 8,201,257 tons, vs. 4,312,938 tons.

Consumption in February was 6,861,624 tons, vs. 10,939,448 tons in the like month of 1957. The total for the first two months this year was 14,891,499 tons, vs. 22,-984,396 tons a year ago.

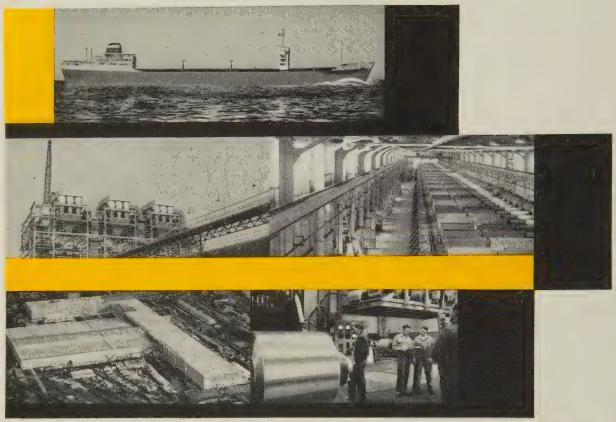
There were only 175 blast furnaces active on the last day of February out of a total 275 in the U. S. and Canada. Last year 259 were operating on the like date.

#### Steel Imports by Country of Origin-1957

			(Ne	t tons)					
				United		Belgium			
				King-	Nether-	Luxem-		West Ger-	All
Products	Total	Canada	Sweden	dom	lands	bourg	France	many	Other
Tracta etc	7,785	77 049	0.0			900	132	113	2
Ingots, etc		7,043	98	9		388			2,487
Wire rods	54,369	151	10,958	10,105		17,799	2,307	10,562	
Reinforcing bars	160,371	60	33	* * * * * *		86,288	55,762	1,261	16,967
Carbon bars	26,108	279	1,148	130		14,196	8,205	320	1,830 129
Alloy bars	1,658	169	1,056	245				59	
Drill steel	1,468		144	60				13	1,251
Skelp	275							0.400	275
Plates	22,166	255		179		3,940	1,272	9,133	7,387
Sheets & strip	25,782	14,298	350	153		4,073	212	5.505	1,191
Tin & terne plate	123	112		11				40.00	
Shapes, 3 in. over	236,663	4,275		823	226	139,509	53,219	13,205	21,404
Shapes, under 3 in.	74,854	739	379	261	890	54,587	11,485	3,636	2,877
Sheet piling	31,808	157				16,754	5,465	9,432	
Rails, accessories	5,045	2,049				1,672	43	1,280	1
Wheels, axles	372	370		2					
Pipe & tubing	190,727	21,414	2,307	19,769	288	4,052	25,099	71,349	46,449
Barbed wire	63,775	56		685	3,511	35,293	2,532	21,169	529
Round wire	70,764	114	584	6,834	9,806	39,148	7,228	6,160	890
Flat wire	14,616	132	4,297	2,450		2,712	2,464	2,532	26
Wire rope	10,814	109	97	2,826	1,038	2,873		3,384	487
Gal. fencing, etc	30,135	11		974	822	22,475	812	5,028	13
Wire nails	134,838	164	107	14,930	11,426	36,462	2,147	28,647	40,955
Bar iron, etc	112	1	40	71					
Cast pipe	5,519	30		1,792			462	42	3,193
Malleable pipe	3,246	5		64				71	3,106
Castings, forgings.	9,395	2,783	195	1,237	27	602	45	1,030	3,476
Die blocks, etc	242	87		66		21	27	19	22
Saw plates	50	4	25	15					6
Fabricated shapes.	91,359	248		6,695		2,375	6,227	26,159	49,655
Sashes, frames	2,709			2,546		25			138
Nails & staples	2,733	233	13	170	243	499	55	766	754
Bolts, nuts, etc.	26,774	685		1.245	4,091	4,037	3,466	3,097	7,209
Bale ties	483				10	358	33	82	
Cotton ties	13,865			7,260		6,237		239	129
Pig iron	225,386	221,165						34	1,052
Sponge iron	9,676	984							
Ferromanganese	281,058	102,047				3.152	101,256	16,289	58,314
Spiegeleisen	3,832	3,795						37	
Ferrosilicon		4,178	619		80		2,920	7,312	15,686
Ferrochrome	30,795	3,082	56	206	10	9	2,020	40	101
Other ferroalloys .	3,506	391,284	41,279	81,813	32,468	499,536	292,880	248,005	287,991
Grand Total			111	143	132	100,000	30	909	7,787
Scrap	204,800	195,688	TIT	7.49	102		30	203	1,101
		~	121 1 7		G	D	-4	2	

Data from American Iron & Steel Institute based on Commerce Department figures.

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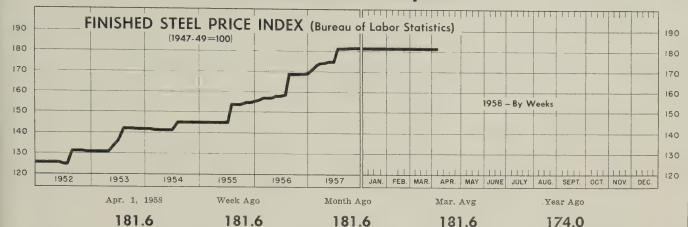
R AND "OLIN ALUMINUM" ARE TRADEMARKS



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#### **Price Indexes and Composites**



#### AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STREL.

D-11: 01: 1 - 1 - 1		
Rails, Standard No. 1	\$5.600	Bars, Reinforcing 6.135
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon 10.360
Tie Plates	6.600	Bars, C.F., Alloy 13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302
Wheels, Freight Car. 33		(lb) 0.553
in. (per wheel)	60.000	Sheets, H.R., Carbon 6.192
Plates, Carbon		Sheets, C.R., Carbon 7.089
	6.150	Sheets, Galvanized 8.270
Structural Shapes	5.942	Sheets, C.R., Stainless, 302
Bars, Tool Steel, Carbon		
(lb)	0.535	
	0.000	Sheets, Electrical 12.025
Bars, Tool Steel, Alloy, Oil		Strip, C.R., Carbon 9.243
Hardening Die (lb)	0.650	Strip, C.R., Stainless, 430
Bars, Tool Steel, H.R.,		(lb) 0.493
Alloy, High Speed, W		Strip, H.R., Carbon 6.095
6.75, Cr 4.5, V 2.1, Mo		Pipe, Black, Buttweld (100
5.5, C 0.60 (lb)	4 965	
	1.355	ft) 19.814
Bars, Tool Steel, H.R.,		Pipe, Galv., Buttweld (100
Alloy, High Speed, W18,		ft) 23.264
Cr 4, V 1 (lb)	1.850	Pipe, Line (100 ft) 199.023
Bars, H.R., Alloy	10.525	Casing, Oil Well, Carbon
Bars, H.R., Stainless, 303	201020	(100 ft) 194.499
	O EOE	
(lb)	0.525	Casing, Oil Well, Alloy
Bars, H.R., Carbon	6.425	(100 ft)

Tubes, Boiler (100 ft) 49.130  Tubing, Mechanical, Carbon (100 ft) 24.953  Tubing, Mechanical, Stainless, 304 (100 ft) 205.608  Tin Plate, Hot-dipped, 1.25  Ib (95 lb base box) 9.783	Black Plate, Canmaking Quality (95 lb base box) Wire, Drawn, Carbon Wire, Drawn, Stainless, 430 (lb) Bale Ties (bundles) Nails, Wire, 8d Common. Wire, Barbed (80-rod spool)	7.583 10.225 0.653 7.967 9.828 8.719
Tin Plate, Electrolytic, 0.25 lb (95 lb base box) 8.483	Woven Wire Fence (20-rod roll)	21.737

#### STEEL'S FINISHED STEEL PRICE INDEX\*

	Apr. 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	227.41	181.31
Index in cents per lb	6.479	6.479	6.479	6.161	4.912

#### STEEL'S ARITHMETICAL PRICE COMPOSITES\*

Finished Steel, NT	\$145.42	\$145.42	\$145.42	\$139.71	\$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	64.70	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	64.23	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	65.77	55.77
Steelmaking Scrap, GT	34.33	34.50	37.17	45.00	43.75

<sup>\*</sup>For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

#### **Comparison of Prices**

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh Bars, H.R., Chicago Hars, H.R., deld., Philadelphia Bars, C. F., Pittsburgh		5.425 5.425 5.725 7.30°	5.425 5.425 5.725 7.30°	5.075 5.075 5.365 6.85*	3.95 3.95 4.502 4.925
Shapes, Std., Pittsburgh Shapes, Std., Chicago Shapes, deld., Philadelphia		5.275 5.275 5.545	5.275 5.275 5.545	5.00 5.00 5.31	3.85 3.85 4.13
Plates, Pittsburgh	5.10 5.10 5.10 5.10 5.10	5.10 5.10 5.10 5.10 5.10	5.10 5.10	4.85	3.90 3.90 4.35 3.90 4.35
Sheets, H.R., Pittsburgh Sheets, H.R., Chicago Sheets, C.R., Pittsburgh Sheets, C.R., Chicago Sheets, C.R., Detroit Sheets, Galv., Pittsburgh	4.925 4.925 6.05 6.05 6.05-6.15 6.60	4.925 4.925 6.05 6.05 6.05-6.15 6.60	6.05-6.1	4.675 5.75 5.75 5.75-5.85	3.775 3.775 4.575 4.575 4.775 5.075
Strip, H.R., Pittsburgh Strip, H.R., Chicago Strip, C.R., Pittsburgh Strip, C.R., Chicago Strip, C.R., Detroit	4.925 4.925 7.15 7.15 7.25	4.925 4.925 7.15 7.15 7.25	4.925 4.925 7.15 7.15 7.25		3.725 10-5.80 5.35 30-6.05
Wire, Basic, Pittsburgh Nails, Wire, Pittsburgh Tin plate (1.50 lb) box, Pitts.	8.95	7.65 8.95 \$10.30	7.65 8.95 \$10.30	7.20 5.225 8.49 \$9.95	

*Including	0.35c	for	special	quality.
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#### SEMIEINISHED STEEL

Billets	, forging,	Pitts.	(NT)	\$96.00	\$96.00	\$96.00	\$91.50	\$70.50
	rods. 7-5				6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Apr. 2 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts	\$67.00	\$67.00	\$67.00	\$65.50	\$55.50
Basic, Valley	66.00	66.00	66.00	64.50	54.50
Basic, deld., Phila	70.41	70.41	70.41	68.38	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	65.00	55.0 <b>0</b>
No. 2 Fdry, Chicago	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, deld., Phila	70.91	70.91	70.91	68.88	59.75
No. 2 Fdry, Birm	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	65.00	55.00
Malleable, Chicago	66.50	66.50	66.50	65.00	55.00
Ferromanganese, Duquesne.	245.00†	245.00†	245.00†	255.00†	228.00°

<sup>†74-76%</sup> Mn, net ton. \*75-82% Mn, gross ton, Etna, Pa.

#### SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	\$33.50	\$34.50	\$36.50	\$43.50	\$44.00
No. 1 Heavy Melt, E. P	38.50	38.50	38.50	50.00	44.50
No. 1 Heavy Melt, Chicago.	31.00	30.50	36.50	41.50	42.75
No. 1 Heavy Melt, Valley	34.50	34.50	37.50	39.50	44.25
No. 1 Heavy Melt, Cleve	31.50	31.50	33.50	37.00	44.25
No. 1 Heavy Melt, Buffalo	28.50	28.50	28.50	43.50	47.00
Rails, Rerolling, Chicago	54.50	54.50	54.50	55.50	56.00
No. 1 Cast, Chicago	41.50	41.50	41.50	39.50	44.00

COKE,	Net 10	n						
Beehive,	Furn.,	Connlsvl.	 \$15.25	\$15.25	\$15.25	\$15.25	\$14.75	
Beehive,	Fdry.,	Connlsvl.	 18.25	18.25	18.25	18.00	17.00	

Mill prices as reported to Steel, Apr. 2, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company. Key to producers, page 147; to footnotes, page 149.

	IFI			

SEMIFIMISHED
INGOTS, Carbon, Forging (NT) Munhall, Pa. U5\$73.5
INGOTS, Alloy (NT)   Detroit S41
BILLETS, BLOOMS & SLABS   Carbon, Rerolling (NT)

2110103 122200 12 0000000
Fairfield, Ala. T277.50
Fontana, Calif. K188.00
Fairfield Ala. T2
Johnstown Pa R3 77 50
I collawanne N W DO 77 50
Munhall Do III
Munhall, Pa. U577.50
Owensboro, Ky. G877.50 S. Chicago, Ill. R2, U577.50
S.Chicago, Ill. R2, U577.50
S. Duquesne, Pa. U577.50
Sterling, Ill. N1577.50
Youngstown R277.50
Carbon, Forging (NT)
Rassamar Do Tie Bocon
Buffalo R2
Canton O R2 98 50
Clairton Pa II5 96 00
Conshohoekon Do 42 401 00
Engley Ale Mo
Ensley, Ala. T2 96,00 Fairfield, Ala. T2 96,00 Fontana, Calif. K1 105,50
Fairtield, Ala. T296.00
Fontana, Calif. K1105.50
Gary, Ind. U596.00
Gary, Ind. U596.00 Geneva, Utah C1196.00
Houston S5 101.00 Johnstown, Pa. B2 96.00
Johnstown, Pa. B2 96.00
Lackawanna, N.Y. B2 96 00
LosAngeles B3 105 50
Los Angeles B3 105.50 Midland. Pa. C18 96.00
Munhall.Pa. U596.00
Owensham Fra GO
Owensboro.Ky. G896.00
Stattle B3
Snaron, Pa. S396.00
Seattle B3
S.Duguesne, Pa. U5 96.00 S.SanFrancisco B3 105.50
S.SanFrancisco B3105.50
Warren, O. C1796.00

Warren, O. C1796.00
Warren, O. C17
Ind. Harbor, Ind. Y1114.00  Johnstown, Pa B2 114.00
Lackawanna. N.Y. B2.114.00
Massillon.O. R2114.00 Midland.Pa. C18
Owensboro, Kv. G8114.00 Sharon, Pa. S3114.00
S. Unicago R2. U5. W14 . 114.00 S. Duquesne, Pa. U5 114.00 Struthers, O. Y1 114.00
Warren, O. C17114.00

ROUNDS, SEAMLESS TUBE (NT)
SKELP         Aliquippa, Pa. J5         . 5.075           Munhall, Pa. U5         4.875           Pittsburgh J5         5.075           Warren O. R2         4.875           Youngstown R2, U5         4.875
WIRE RODS         Alabamac(ity, Ala.         R2         6.15           Alajquippa, Pa.         J5         6.15         6.15           Alton, Ill.         L1         6.35           Buffalo         W12         6.15           Cleveland         A7         6.15           Donora, Pa.         A7         6.15           Fairfield, Ala.         T2         6.15           Houston         S5         6.40           Indiana Harbor, Ind.         Y1         6.15           Johnstown, Pa.         B2         6.15           Joliet, Ill.         A7         6.15           KansasCity, Mo.         S5         6.40           Kokomo, Ind.         C16         6.25           LosAngeles         B3         6.95           Minnequa, Colo.         C10         6.40

Monessen, Pa. P7 .	6.15
N. Tonawanda, N.Y.	
Pittsburg, Calif. C11	
Portsmouth.O. P12	
Roebling, N.J. R5 .	
S. Chicago, Ill. R2 .	
SparrowsPoint.Md.	
Sterling, Ill. (1) N15	
Sterling, Ill. N15 .	
Struthers.O. Y1	
Worcester, Mass. A7	
Worcester, Mass. At	0.40
STRUCTUR	AIC
SIKUCIUK	ALS

STRUCTURALS
Carbon Steel Std. Shapes Alabama City, Ala. R2 . 5.275 Atlanta A11 5.475 Atlanta A11 5.475 Aliquippa, Pa. J5 . 5.275 Bessemer, Ala. T2 . 5.275 Bethlehem, Pa. B2 . 5.325 Birmingham C15 . 5.275 Clairton, Pa. U5 . 5.275 Fairfield, Ala. T2 . 5.275 Fontana, Calif. K1 . 6.075 Gary, Ind. U5 . 5.275 Geneva, Utah C11 . 5.275 Houston S5 . 5.375 Ind. Harbor, Ind. I-2 . 5.275 Johnstown, Pa. B2 . 5.325 Johet, Ill. P22 . 5.275 KansasCity, Mo. S5 . 5.375 Lackawanna, N. Y. B2 . 5.325 Los Angeles B3 . 5.975 Minnequa, Colo. C10 . 5.575 Minnequa, C0lo. C10 . 5.57
Wide Flange

Wide Flang	
Detillenem, Pa R2	5 20
Ciairton, Pa. 175	5 97
rontana. Calif K1	0 00
Indiana Harbor Ind	T 9 E 97
Lackawanna N V	D0 = 20
Muman, Pa. 115	E 07
Fittiemxville, Pa. PA	5 20
e. Unicago, III TIE	E 02
Weirton, W. Va. W6	5 27

Aliquippa.Pa. J5		_		
Claire a. Jo		6.	5.	ä
S. Chicago, Ill. U5		6.	5	i.
H.S., L.A. Std. Shape Aliquippa, Pa. J5	s	7	7:	

H.S., L.A. Std. Shapes	
Aliquippa, Pa. J57.7	5
Bessemer, Ala. T2 7.7	5
Detinienem, Pa. B2 7 8	0
Clairton, Pa. U5 77	
Fairfield, Ala. T2 77	=
Fontana, Calif. K1 0 5	=
Gary, Ind. U57.7	5
Geneva, Utan (11)	K
Houston S5	9
Ind. Harbor, Ind. I-2, Y1.7.7	9
Johnstown, Pa. B27.8	0
Kangag City Ma	J
KansasCity, Mo. S5 7.88	5
Lackawanna, N. Y. B2 7.8	J
LosAngeles B38.4	5
Mullian, Fa. IIb	~
S. CHICARO, III IIS TX714 F F	_
S. Saurrancisco B3 0 44	α.
Struthers, O. Y17.7	3
	2

H.S., L.A. Wi	de Flange
Bethlehem, Pa. H Lackawanna, N. Y	7 827.80
munnan, Pa. 115	ヴ カド
S. Chicago, Ill. U	57.75

#### PILING

READING DUES

Bethlehem, Pa. B25.325 Lackawanna, N.Y. B25.325
Munhall, Pa. U55.275 S. Chicago, Ill. U55.275
STEEL SHEET PILING         .6.225           Lackawanna, N. Y. B2         .6.225           Munhall, Pa.         .05         .6.225           S.Chicago, III.         .05         .6.225           Weirton, W. Va.         .06         .025

#### **PLATES**

PLATES, Carbon Steel
AlabamaCity, Ala. R25.10
Aliquippa, Pa. J55.10
Ashland, Ky. (15) A105.10
Atlanta A115.30
Bessemer, Ala. T25.10
Clairton, Pa. U55.10
Claymont, Del. C225.10

Cleveland J5, R25.20	Cleveland(9) R25.425
Coatesville, Pa. L75.10	Ecorse, Mich. (9) G55.525
Conshohocken, Pa. A3 5.20	Emeryville, Calif. J76.175
Ecorse, Mich. G55.20	Fairfield, Ala. (9) T2 5.425
Fairfield, Ala. T25.10	Fairless, Pa. (9) U55.575
Fontana, Calif. (30) K15.90	Fontana, Calif. (9) K1 6.125
Gary, Ind. U55.10	Gary, Ind. (9) U55.425
Geneva, Utah C115.10	Houston(9) S55.675
GraniteCity, Ill. G45.30	Ind. Harbor (9) I-2, Y15.425
Harrisburg, Pa. P45.10	Johnstown, Pa. (9) B2 5.425
Houston S55.20	Joliet.III. P225.425
Ind. Harbor, Ind. I-2, Y1 5.10	KansasCity, Mo. (9) S5 5.675
Johnstown, Pa. B25.10	Lackawanna(9) B25.425
Lackawanna, N.Y. B25.10	LosAngeles(9) B36.125
LoneStar.Tex. L65.20	Midland, Pa. (23) C18 5.725
Mansfield, O. E65.10	Milton, Pa. M185.575
Minnequa, Colo. C105.95	Minnegua, Colo. C105.875
Munhall, Pa. U55.10	Niles, Calif. P16.125
Newport, Ky. A25.10	N.T'wanda, N.Y. (23) B115.775
Pittsburgh J55.10	Owensboro, Ky. (9) G8 5.425
Riverdale, Ill. A15.10	Pittsburg, Calif. (9) C11.6.125
Seattle B36.00	Pittsburgh(9) J55.425
Sharon, Pa. S35.10	Portland, Oreg. 046.175
S.Chicago, Ill. U5, W145.10	Seattle B3, N146.175
SparrowsPoint, Md. B25.10	S.Ch'c'go(9)R2,U5,W14 5.425
Sterling, Ill. N155.10	S. Duquesne, Pa. (9) U55.425
Steubenville, O. W105.10	S.SanFran., Calif. (9) B3 6.175
Warren, O. R25.10	Sterling, Ill. (1) (9) N155.425
Youngstown U5, Y15.10	Sterling III (9) N155.525
, , , , , , , , , , , , , , , , , , ,	Struthers, O. (9) Y1 5.425
PLATES, Carbon Abras, Resist.	Tonawanda, N.Y. B12 5.425
Claymont, Del. C226.75	Torrance, Calif. (9) C116.125
Fontana, Calif. K17.55	Youngstown(9) R2, U5.5.425
Geneva, Utah C116.75	
Houston S56.85	BARS, H.R. Leaded Alloy
Johnstown.Pa. B26.75	(Including leaded extra)
SparrowsPoint, Md. B2 6.75	Warren, O. C177.475

Economy, Pa. B1413.1
PLATES, H.S., L.A.
Aliquippa, Pa. J57.62
Bessemer.Ala. T27.62
Clairton, Pa. U57.62
Clairton, Pa. U5 7.62 Claymont, Del. C22 7.62
Cleveland J5. R2 7.62
Coatesville, Pa. L77.92
Coatesville, Pa. L77.92 Conshohocken, Pa. A37.62
Economy, Pa. B14 7.62
Ecorse, Mich. G57.72
Fairfield, Ala. T27.62
Farrell, Pa. S37.62
Fontana, Calif. (30) K1 .8.42
Gary, Ind. U57.62 Geneva, Utah C117.62
Geneva. Utah C11 7.62
Houston S57.72
Ind. Harbor, Ind. I-2, Y1 7.6?
Johnstown, Pa. B2 7.62
Munhall, Pa. U57.62
Pittsburgh J57.62
Seattle B3
Sharon, Pa. S37.62 S. Chicago, Ill. U5, W14 .7.62
S.Chicago, Ill. U5, W14 . 7.62
SparrowsPoint, Md. B27.62
Warren, O. R27.62
Youngstown U57.62

PLATES, Wrought Iron

PLATES, ALLOY	
Aliquippa, Pa. J57.	21
Claymont, Del. C227.	
Coatesville, Pa. L77.	
Economy.Pa. B147.	
Fontana, Calif. K18.	
Gary, Ind. U57.	
Houston S57.3	
Ind. Harbor, Ind. Y17.	
Johnstown, Pa. B27.	
Lowellville, O. S37.	
Munhall, Pa. U57.	
Newport, Ky. A27.	20
Pittsburgh J57.5	21
Seattle B38.	
Sharon, Pa. S37.	2(
S. Chicago. Ill. U5, W147.:	
SparrowsPoint.Md. B2 7.5	2(
Youngstown Y17.5	20

51000 DIATES		
FLOOR PLATES		0 17
Cleveland J5		
Conshohocken, Pa.		
Ind. Harbor, Ind. I-		
Munhall, Pa. U5 .		
S.Chicago, Ill. U5.	• •	 .6.17

PLATES, Ingot fron	
Ashland c.l. (15)	A105.35
Ashland l.c.l. (15)	A105.85
Cleveland c.l. R2	5.85
Warren, O. c.l. R2	5.85

#### **BARS**

BARS, Hot-Rolled Carbon
(Merchant Quality)
Ala.City, Ala. (9) R25.425
Aliquippa, Pa. (9) J55.425
Alton, Ill. L15.625
Atlanta(9) A115.625
Bessemer, Ala. (9) T25.425
Birmingham (9) C15 5.425
Buffalo(9) R25.425
Clairton, Pa. (9) U55.425

Cleveland(9) R25.425
Ecorse, Mich. (9) G55.525
Cleveland(9) R25.425 Ecorse, Mich. (9) G55.525 Emeryville, Calif. J76.175
Fairfield, Ala. (9) T25.425
Fairless, Pa. (9) U55.575
Fontana, Calif. (9) K16.125
Gary, Ind. (9) U55.425
Houston(9) S55.675
Ind. Harbor (9) I-2, Y15.425
Johnstown, Pa. (9) B2 5. 425
Toliat III D22 5 425
Joliet, Ill. P225.425 Kansas City, Mo. (9) S55.675
KansasCity, Mo. (9) 555.010
Lackawanna (9) B25.425
LosAngeles(9) B36.125
Midland, Pa. (23) C185.725
Milton, Pa. M185.575 Minnequa, Colo. C105.875
Minnequa, Colo. C105.875
Niles, Calif. P16.125
N.T'wanda, N.Y. (23) B115.775
Owensboro, Ky. (9) G8 5.425
Pittsburg, Calif. (9) C11.6.125
Pittsburgh(9) J55.425
Portland, Oreg. 046.175
Seattle B3, N146.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Ch'c'go(9)R2,U5,W14 5.425 S.Duquesne,Pa.(9) U55.425
S.SanFran., Calif. (9) B3 6.175
Sterling, Ill. (1) (9) N155.425
Starling III (9) N15 5.525
Struthers, O. (9) Y1 5.425
Tonawanda, N.Y. B12 5.425
Torrance, Calif. (9) C11 6.125
Youngstown(9) R2, U5.5.425

BARS, Hot-Rolled Alloy Aliquippa, Pa. J56.475 Bethlehem, Pa. B26.475
Aliquippa, Pa. J56.475
Bethlehem.Pa. B26.475
Bridgeport.Conn. C326.55
Buffalo R26.475
Buffalo R26.475 Canton,O. R2, T76.475
Clairton, Pa. U56.475
Detroit S41 6 475
Detroit S416.475 Economy, Pa. B146.475
Ecorse, Mich. G56.575
Fairless.Pa. U56.625
Farrell Da 93 6 475
Farrell, Pa. S36.475 Fontana, Calif. K17.5°5
Gary, Ind. U56.475
Houston S56.725
Ind. Harbor, Ind. I-2, Y1.6.475
Johnstown, Pa. B26.475
KansasCity, Mo. S56.725
Lackawanna, N.Y. B2 6.475
Lowellville, O. S36.475
LosAngeles B37.525
Massillon, O. R26.475
Midland, Pa. C186.475
Owensboro, Ky. G86.475
Pittsburgh J56.475
Sharon.Pa. S36.475
Sharon.Pa. S36.475 S.Chicago R2, U5, W14 6.475
S. Duquesne, Pa. U5 6.475
Struthers, O. Y1 6.475
Warren, O. C176.475
Youngstown U56.475

#### BARS & SMALL SHAPES, H.R.

High-Strength, Low-Alloy
Aliquippa, Pa. J57.925
Bessemer, Ala. T27.925
Bethlehem, Pa. B27.925
Clairton, Pa. U57.925
Cleveland R27.925
Ecorse, Mich. G58.025
Fairfield, Ala. T27.925
Fontana, Calif. K18.625
Gary, Ind. U57.925
Houston S58.175
Ind. Harbor, Ind. Y17.925
Johnstown, Pa. B27.925
KansasCity, Mo. S58.175
Lackawanna, N.Y. B2 7.925
LosAngeles B38.625
Pittsburgh <b>J5</b> 7.925
Seattle B38.675
S.Chicago, Ill. U5, W14.7.925
S. Duquesne, Pa. U5 7.975
S.SanFrancisco B38.675
Struthers, O. Y17.925
Youngstown U57.925

BAR	SIZE	ANG	GLES;	H.R	t. C	ark	on
Beth	leher	n, Pa	1. (9)	B2		5.8	575
Hous	ston(	9)	S5			5.6	375
Kan	sasCi	ty, N	10. (9	9) 8	5	5.1	675
Lacl	cawa:	nna	(9) ]	B2 .		5.4	125
	ling, I						
	ling, I						
	3372 n						

BAR	SIZE	ANG	LES;	\$.	Shapes
Aliqı	iippa,	Pa.	J5 .		.5.425
Atlaı	nta A	.11 .			.5.625
Jolie	t, Ill.	P22			.5.425
Niles	,Calii	f. P1			. 6.125
Pitts	burgh	J5			.5.425
Port!	and, C	reg.	04		.6.175
SanF	'ranci	sco S	57 .		.6.275
Seatt	le B	3			. 6.175

BAR	SHAPES,	Hot-Ro	lled		Alloy
Alia	uippa, Pa.	. J5			.6.55
Clair	ton.Pa.	U5 .			.6.55
Gary	,Ind. U	·			.6.55
Hous	ston S5				.6.80
Kan	sasCity, N	fo. S5			.6.80
Pitts	burgh J	5		*	. 6.55
Your	ngstown	U5			.6.55

#### BARS, C.F., Leaded Alloy (Including leaded extra)

\*Grade A; add 0.50c for Grade B.

#### BARS, Cold-Finished Carbon

· ·
Ambridge, Pa. W187.30
BeaverFalls, Pa. M12, R2, 7.30
Birmingham C157.90
Buffalo B5
Buffalo B57.35 Camden, N.J. P137.75
Carnegie Pa C12 7 30
Chicago W18 7 30
Claveland A7 C20 7 30
Detroit D5 D17 750
Carnegie, Pa. C12 7.30 Chicago W18 7.30 Cleveland A7, C20 7.30 Detroit B5, P17 7.50 Detroit S41 7.30 Donora, Pa. A7 7.30 Elyria, O. W8 7.30
Denoma Da 47 7 20
Donora, Pa. A1
FranklinPark,Ill. N57.30
Gary, Ind. R27.30 Green Bay, Wis. F77.30
GreenBay, Wis. Fit7.30
Hammond, Ind. J5, L2 7.30
Hartford, Conn. R27.80
Hartiord, Conn. R2
LosAngeles (49) S308.75
LosAngeles P2, R28.75
Mansfield, Mass. B57.85
Massillon.O. R2, R87.30
Monaca, Pa. S177.30
Newark, N.J. W187.75
Pittsburgh J5
Plymouth, Mich. P57.55
Putnam.Conn. W187.85
Readville, Mass. C147.85
S. Chicago, Ill. W14 . 7.30 SpringCity, Pa. K3 . 7.75 Struthers, O. Y1 . 7.30
SpringCity.Pa. K37.75
Struthers.O. Y17.30
Warren, O. C177.30 Willimantic, Conn. J57.80
Willimantic, Conn. J57.80
Waukegan.Ill. A77.30
Waukegan, Ill. A7 7.30 Youngstown F3, Y1 7.30
0

#### BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland, Md. (5) C19 .6.55

#### BARC Cald Cintaled All

BARS, C				
Ambrid Beaver! Bethleh Bridgep	ge.Pa.	W18		8.775
Beaverl	Falls, Pa	. M1	2.R2	8.775
Bethleh	em, Pa.	B2		8.775
Bridgep	ort, Con	n. C	32	8.925
Buffalo	B5 .			8.775
Buffalo Camder	, N.J.	P13		.8.95
Canton, Carnegi Chicago Clevelar	O. T7			8.775
Carnegi	e,Pa. (	C12 .		8.775
Chicago	W18 .			8.775
Cieveia	nd A7,	C20		8.775
Detroit	841 .			8.775
Flyria (	Pa. A			3.775
Detroit Donora, Elyria, Frankli	n Dowle 1	71 27	=	8.779
Gary In	d Do	111. 14	o e	5.110
Gary, In Green Ba	av Wie	1277		5.110
Hammo	nd Ind	TE	T 9 (	コアケビ
Hartfor	d.Conn	R2	، ، سده	0.075
Hartfor Harvey, Lackaw	Ill. B5			775
Lackaw	anna.N	Y. F	32	8 775
LUSANG	eles PZ	. S30		10.75
Wangtie	id Mage	7 TO 2		075
Midland	Pa. C	18	8	3.775
Monaca	Pa. S:	17	8	3.775
Midland Monaca Newark Plymout S. Chicas SpringC Struther Warren.	.N.J. V	V18 .		8.95
Plymout	h, Mich	. P5	8	3.975
S. Chica;	zo.Ill.	W14	8	3.775
SpringC	ity, Pa.	K3		8.95
Morror	8.U. Y	1	۶۰۰۰۶	3.775
Warren,	O. UI7		5	3.775
Walkeg	an, III.	A.7		5.775
Woroost	or Moor	111. J	9 6	7.075
Warren, Waukeg Willima: Worcest Youngst	own F	2 V1	2	G107.
2 Juligat	OWIL I	J, I.J.	2	. 770

Birmingham C15 5.425 Buffalo R2 5.425 Cleveland R2 5.425 Cleveland R2 5.425 Ecorse, Mich. G5 5.775 Emeryville, Calif. J7 6.175 Fairfield, Ala. T2 5.425 Fairless, Pa. U5 5.575 Fontana, Calif. K1 6.125 Ft. Worth, Tex. (4) (26) T4 5.875 Gary, Ind. U5 5.425 Houston S5 5.675 Ind. Harbor, Ind. I-2, Y1 5.425 Johnstown, Pa. B2 5.425 Lackawanna, N.Y. B2 5.425 Lackawanna, N.Y. B2 5.425 Johnstown, Pa. M18 5.576 Minnequa, Colo. C10 5.875 Niles, Calif. P1 6.125 Pittsburg, Calif. C11 6.125 Pittsburg, Calif. C11 6.125 Pittsburg, Calif. C11 6.125 Pittsburg, Calif. C11 6.125 Scattle B3, N14 6.175 S. Chicago, Ill. R2 5.425 S. SanFrancisco B3 6.175 SparrowsPoint, Md. B2 5.425 Sterling, Ill. (1) N15 5.425 Sterling, Ill. N15 5.525 Sterling, Ill. N15 5.525 Sterling, Ill. N15 5.525 Sterling, Ill. N15 5.425 Tonawanda, N.Y. B12 6.00 Torrance, Calif. C11 6.125 Youngstown R2, U5 5.425 Tonawanda, N.Y. B12 6.00 Torrance, Calif. C11 6.125 Youngstown R2, U5 5.425 BARS, Reinforcing (Fabricated; to Consumers) (Fabricated; to Consumers) Graphicated; to Consumers) Boston B2, U8 7.65 Chicago U8 6.91 Cleveland U8 6.89 Houston S5 7.35 Johnstown, Pa. B2 7.08 Marion, O. P11 6.70 Newark, N.J. U8 7.55 Philadelphia U8 7.38 Pittsburgh J5, U8 7.10 SandSprings, Okla. S5 7.60 Seattle B3, N14 7.70 SparrowsPt., Md. B2 7.08 St. Pall U8 7.92 Williamsport, Pa. S19 7.00 BARS, Wrought Iron Economy, Pa. (S. R.) B14 14.45	SHEETS, Hoi-Rolled Steel (18 Gage and Heavier) AlabamaCity,Ala. R2 . 4.925 Allenport,Pa. P7 . 4.925 Ashland,Ky. (8) A10 . 4.925 Cleveland J5, R2 . 4.925 Conshohocken,Pa. A3 . 4.975 Detroit (8) M1 . 5.025 Fairfield,Ala. T2 . 4.925 Fairless,Pa. U5 . 4.975 Fairfield,Ala. T2 . 4.925 Fairless,Pa. U5 . 4.975 Fontana,Calif. K1 . 5.675 Gary,Ind. U5 . 4.925 GraniteCity,III. (8) G4 . 5.125 Ind.Harbor,Ind. I-2, Y1 4.925 Irvin,Pa. U5 . 4.925 Ind.Harbor,Ind. I-2, Y1 4.925 Ind.Harbor,Ind. I-2, Y1 4.925 Mansfield,O. E6 . 4.925 Munhall,Pa. U5 . 4.925 Newport,Ky. (8) A2 . 4.925 Newport,Ky. (8) A2 . 4.925 Newport,Ky. (8) A2 . 4.925 Pittsburg, Calif. C11 . 5.625 Pittsburgh J5 . 4.925 Riverdale, Ill. A1 . 4.925 Sharron,Pa. S3 . 4.925 Sharron,Pa. S3 . 4.925 Schlcago, III. W14 . 4.925 Steubenville,O. W10 . 4.925 Steubenville,O. W10 . 4.925 Voungstown U5, Y1 . 4.925 Youngstown U5, Y1 . 4.925 SHEETS, H.R. (19) Ga. & Lighter Niles,O. M21 . 6.05 SHEETS, H.R. Alloy Gary,Ind. U5 . 8.10 Ind.Harbor,Ind. Y1 . 8.10 Irvin,Pa. U5 . 8.10	Conshohocken, Pa. A. 3. 7.325 Ecorse, Mich. G5 . 7.375 Fairfield, Ala. T2 7.275 Fairfield, Ala. T2 7.275 Fairfiels, Pa. U5 7.325 Farrell, Pa. S3 7.275 Fontana, Calif. K1 8.025 Gary, Ind. U5 7.275 Ind. Harbor, Ind. I-2, Y1 7.275 Lackawanna (35) B2 7.275 Munhall, Pa. U5 7.275 Schicago, Ill. U5, W14 7.275 Sharon, Pa. S3 7.275 Sharon, Pa. S3 7.275 Swarren, O. R2 7.275 Weirton, W. Va. W6 7.275 Youngstown U5, Y1 7.275  SHEETS, Hoi-Rolled Ingot Iron (18 Goge and Heavier) Ashland, Ky. (8) A10 5.175 Cleveland R2 5.675 Warren, O. R2 5.675 Warren, O. R2 6.80 Middletown, O. A10 6.55 Warren, O. R2 6.80  SHEETS, Cold-Rolled Ingot Iron Cleveland R2 6.80 Middletown, O. A10 6.55 Warren, O. R2 6.80  SHEETS, Cold-Rolled Steel (Commercial Quality) AlabamaCity, Ala. R2 6.05 Allenport, Pa. P7 6.05 Cleveland J5, R2 6.05 Conshohocken, Pa. A3 6.10 Detroit M1 6.05 Ecorse, Mich. G5 6.15 Fairfield, Ala. T2 6.05 Fairfield, Ala. T2 6.05 Fontana, Calif. K1 7.30 Gary, Ind. U5 6.05 Fontana, Calif. K1 7.30 Gary, Ind. U5 6.05 Fontana, Calif. K1 7.30 Gary, Ind. U5 6.05 Fontane, City, Ill. G4 6.25 Ind. Harbor, Ind. I-2, Y1 6.05 Frirb, Pa. U5 6.05 Fontana, Calif. K1 7.30 Gary, Ind. U5 6.05 Fontsmouth, O. A10 6.05 Newport, Ky. A2 6.05 Portsmouth, O. A10 6.05 Portsmouth, O. P12 6.05 SparrowsPoint, Md. B2 6.05 Fortsmouth, O. P12 6.05 SparrowsPoint, Md. B2 6.05 Vorkville, O. W10 6.05 Voungstown Y1 6.05	SHEETS, Cold-Rolled, High-Strength, Low-Alloy Cleveland J5, R2	SHEETS, Well Casing Fontana, Calif. K1
A3 Alan Wood Steel Co. A4 Allegheny Ludlum Steel A5 Alloy Metal Wire Div., H. K. Porter Co. Inc. A6 American Shim Steel Co. A7 American Steel & Wire Div., U. S. Steel Corp. A8 Anchor Drawn Steel Co. A9 Angell Nail & Chaplet A10 Armco Steel Corp. A11 Atlantic Steel Co. B1 Babcock & Wilcox Co. B2 Bethlehem Steel Co. B3 Beth. Pac. Coast Steel B4 Blair Strip Steel Co. B5 Bliss & Laughlin Inc. B8 Braeburn Alloy Steel B9 Brainard Steel Div., Sharon Steel Corp. B10 E. & G. Brooke, Wick-wire Spencer Steel Div., Colo. Fuel & Iron B11 Buffalo Bclipse Corp. B12 Buffalo Steel Corp. B14 A. M. Byers Co. B15 J. Bishop & Co. C1 Calstrip Steel Corp. C2 Calumet Steel Div., Borg-Warner Corp. C4 Carpenter Steel Co. C9 Colonial Steel Co. C10 Colorado Fuel & Iron C11 Columbia-Geneva Steel C12 Columbia Steel & Shaft. C13 Columbia Steel Steel Shaft. C15 Connors Steel Div., C16 Connors Steel Div., C16 Connors Steel Div., C16 Connors Steel Div., C17 Connors Steel Div., C17 Connors Steel Div., C17 Connors Steel Div., C18 CONNORMAN CO	C22 Claymont Plant, Wick- wire Spencer Steel Div., Colo. Fuel & Iron C23 Charter Wire Inc. C24 G. O. Carlson Inc. C32 Carpenter Steel of N.Eng. D2 Detroit Steel Corp. D3 Dearborn Div., Sharon Steel Corp. D4 Disston Div., H. K. Porter Co. Inc. D6 Driver-Harris Co. D7 Dickson Weatherproof Nail Co. D8 Damascus Tube Co.	J4 Johnson Steel & Wire Co. J5 Jones & Laughlin Steel J6 Joslyn Mfg. & Supply J7 Judson Steel Corp. J8 Jersey Shore Steel Co. K1 Kaiser Steel Corp. K2 Keokuk Electro-Metals K3 Keystone Drawn Steel K4 Keystone Drawn Steel K4 Keystone Steel & Wire K7 Kenmore Metals Corp. L1 Laclede Steel Co. L2 LaSalle Steel Co. L3 Latrobe Steel Co. L6 Lone Star Steel Co. L6 Lone Star Steel Co. L7 Lukens Steel Co. L9 Lukens Steel Corp. M4 Mahoning Valley Steel M6 McLouth Steel Corp. M8 Mid-States Steel & Wire M12 Moltrup Steel Products M14 McInnes Steel & Wire M14 Moltrup Steel Products M14 McInnes Steel Co. M16 Md. Fine & Special. Wire M17 Metal Forming Corp. M8 Milton Steel Div., Merritt-Chapman&Scott M21 Mallory-Sharon Metals Corp. M22 Mill Strip Products Co. N3 National Tube Div., U. S. Steel Corp. N5 Nelsen Steel & Wire Co. N6 New England High Carbon Wire Co. N8 Newman-Crosby Steel N9 Newport Steel Corp. N14 Northwestern S.&W.Co. N20 Neville Ferro Alloy Co.	P1 Pacific States Steel Corp. P2 Pacific Tube Co.	S25 Stainless Welded Prod. S26 Specialty Wire Co. Inc. S30 Sierra Drawn Steel Corp. S40 Seneca Steel Service S41 Stainless Steel Div., J&L Steel Corp. S42 Southern Elec. Steel Co. T2 Tenn. Coal & Iron Div., U. S. Steel Corp. T3 Tenn. Products & Chemical Corp. T4 Texas Steel Co. T5 Thomas Strip Div., Pittsburgh Steel Co. T6 Thomas Strip Div., Pittsburgh Steel Co. T7 Timken Roller Bearing T9 Tonawanda Iron Div., Am. Rad. & Stan. San. T13 Tube Methods Inc. T19 Techalloy Co. Inc. U4 Universal-Cyclops Steel U5 United States Steel Corp. U6 U. S. Pipe & Foundry U7 Ulbrich Stainless Steels U8 U. S. Steel Corp. U2 Vanadium-Alloys Steel V3 Vulcan Crucible Steel Div., H. K. Porter Co. W1 Wallace Barnes Co. W2 Wallingford Steel Corp. W6 Western Automatic Machine Screw Co. W9 Westland Tube Co. W9 Westland Tube Co. W10 Wheeling Steel Corp. W12 Wickwire Spencer Steel Div., Colo, Fuel & Iron W13 Wilson Steel & Wire Co. W14 Wisconsin Steel Div., International Harvester W15 Woodward Iron Co. W16 Wyckoff Steel Co.

· April 7, 1958

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STRIP  ST					
Start   Control   Contro	STRIP				r II.
And. C. H. J. And. C. C. J. C.	STRIP, Hot-Rolled Carbon	Carnegle, Pa. S1815.05		Aliquippa, Pa. J5 \$8.75 \$9.00 \$9	.40
Addon. L. L. 1. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4.	Ala.City, Ala.(27) R24.925	Dover.O. G615.05		Fairfield, Ala. T2 8.85 9.10 9	
Martine A. 10 A.	Alton, Ill. L15.125	Farrell, Pa. S315.05		Fontana, Calif. K1 9.50 9.75 10	
Company   Comp	Ashland, Ky. (8) A104.925 Atlanta A114.925	Harrison, N.J. C1815.05	Dover.O. G67.15*	GraniteCity, Ill. G4 8.85 9.10 9	.50
Section   Column	Bessemer, Ala. T24.925 Birmingham C154.925	Lowellville, O. S315.05	Evanston, Ill. M227.25* Riverdale, Ill. A17.25*	Irvin, Pa. U5 8.75 9.00 9	.40
Dectar   11	Buffalo(27) R24.925	Riverdale, Ill. A115.05	Warren, O. B9, T5 7.15*	Pittsburg, Calif. C11 9.50 9.75 10	.15
Particular Alb. T.	Detroit M15.025	Worcester, Mass. A715.35	Youngstown J57.15*	Weirton, W. Va. W6 8.75 9.00 9.	.40
Carpinell   13.   1.45   1.55   1.6	Fairfield, Ala. T24.925		*Plus galvanizing extras.		.40
Debtoom Par (20)   10.4   10	Gary, Ind. U54.925			Aliquippa, Pa. J5 7.725 7.925	
Description	Johnstown, Pa. (25) B2., 4.925	Cleveland A710.45 Dearborn Mich. D310.60		TIN PLATE, American 1.25 1.50 Niles, O. R2	.85
Section   Company   Comp	LosAngeles (25) B35.675	Dover, O. G6		b Fittsburg, Calif. C118.	.60
Santlief VI	Riverdale, Ill. A14.925	Farrell, Pa. S310.50	Atlanta A115.65 Riverdale III. A15.50	Fairfield, Ala. T2 10.15 10.40 Weirton, W. Va. W67.	.85
Sharron P. S.   9.50   5.00	Seattle (25) B35.925	Sharon, Pa. S310,50	Sharon, Pa. S35.35	Fontana, Calif. K1 10.80 11.05	
S. Chiespan W. 14. 20. 35 september 1. 20. 20. 20. 20. 20. 20. 20. 20. 20. 20				Ind. Harb. Y1 10.05 10.30 Black Plate (29 Gage)	.50
Selection   Human   100   10	S.Chicago W144.925	Spring Steel (Annealed) 0.4	40C 0.60C 0.80C 1.05C 1.35C	Sp.Pt., Md. B2., 10.15 10.40 Gary, Ind. U57.	.50
Sterling III. NIS	SparrowsPoint, Md. B24.925	Baltimore T6 9. Boston T6 9.	50 10.70 12.90 15.90 18.85	Yorkville O. W10 10.05 10.30 Ind. Harbor, Ind. Y17.	.50
Warron, W. 1. W. 1. 950 Werton, W. 1	Sterling, Ill. N155.025	Bristol, Conn. W1	10.70 12.90 16.10 19.30	BLACK PLATE (Base Box) Yorkville, O. W107.	.50
Youngstown Us	Warren, O. R24.925	Cleveland A7 8.	95 10.40 12.60 15.60 18.55	Fairfield, Ala. T27.95	
STRP, No-Solied Alley		Detroit D2 9.	0.05 10.50 12.70 15.70	Fontana, Calif. K18.60 Gary, Ind. U5\$9.	.70
Carnegic Pa. S18   S. 10   Farmiting Part	STRIP, Hot-Rolled Alloy	Evanston, Ill. M22 8.	3.95 10.40 12.60 15.60	Gary, Ind. U57.85	.10
Control Color   Control Color   Colo		FranklinPark, Ill. T6 9.	.05 10.40 12.60 15.60 18.55	Ind. Harbor, Ind. I-2, Y17.85 (8 lb Coated, Base Box)	.25
Indi-Hardor, Ind.   Y1	Gary, Ind. U58.10	Indianapolis J5 9.	.10 10.55 12.60 15.60 18.55		_
Contended   Cont	Ind.Harbor,Ind. Y18.10	LosAngeles J5 11.	15 12.60 14.80	Postsmouth 0 P12 0	20
NewFork No. 2   3.10   New York W 3   10.70   12.90   15.00   Allentinal N. H.   1.00   Allent	LosAngeles B39.30	NewCastle, Pa. B4, E5 8.	.95 10.40 12.60 15.60	WIRE, Manufacturers Bright, Roebling, N.J. R59.	.60
Sharon, Fa. A. 83  Sharon, Fa. A. 85  Sharon, Fa. 85		NewHaven, Conn. D2 9. NewKensington, Pa. A6 8.	.40 10.70 12.90 15.90 .95 10.40 12.60 15.60	AlabamaCity, Ala. R27.65 S. SanFrancisco C1010.	.25
String   Action   String   Action   String   Action   String   Action   String   Action   String   Action   A		New York W3	10.70 12.90 16.10 19.30	Alton, Ill. L17.85 Struthers, O. Y19.	.30
Starton-Pa. S.   S.   S.   S.   S.   S.   S.   S.	Youngstown U5, Y18.10	Riverdale, Ill. A1 9.	0.05 10.40 12.60 15.60 18.55	Bartonville, Ill. K47.75 Waukegan, Ill. A79.	.30
Reasemer Alla 72		Sharon, Pa. S3 8.	.95 10.40 12.60 15.60 18.55	Chicago W137.65	
Conshipocken, Pa. As. 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7,		Wallingford, Conn. W2 9.	.40 10.70 12.90 15.90 18.75	Crawfordsville, Ind. M87.75 Aliquippa, Pa. J59.	.30
Pairfield.Ala. T2	Conshohocken, Pa. A37.325	Worcester, Mass. A7, T6 9.	.50 10.70 12.90 15.90 18.85	Duluth A7	.40
Gary, Ind. US	Fairfield, Ala. T27.325	Tourgstown of		Fostoria, O. (24) S17.75 Cleveland A79.	.30
Lackawanna.N.Y. B2	Gary, Ind. U57.325	Spring Steel (Tempered)	0.80C 1.05C 1.35C	Jacksonville, Fla. M88.00 Duluth A79.	.30
Seattle (25) B3	Lackawanna, N.Y. B2 7.325	Buffalo W12	18.10	Joliet, Ill. A77.65 Johnstown, Pa. B29.	30
S.Chicago, III. W14 7.225 SSABFTARIGEO(2) B 38. 777 Palmer, Mass. W12 18.10 21.55 28.30 Minnequa, Colo. C10 9.50 Sparrowar Oint. Md. B2. 7.232 Typer Palmer, Mass. W12 18.10 21.55 28.30 Minnequa, Colo. C10 9.50 Sparrowar Oint. Md. B2. 7.232 Typer Palmer, Mass. W12 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Worcsetz Mass. A7, T6 18.10 21.55 28.30 Palmer, Mass. W12 7.55 Palmer, Mass. W12 19.50 Palmer, Mass. W1	Seattle(25) B38.325	FranklinPark, Ill. T6	18.45 22.30 26.65	Kokomo, Ind. C167.75 Los Angeles B310.	.25
SparrowsPoint, Md. B2. 7.325   Warreno, R2. 2. 7.325	S.Chicago, Ill. W147.325	New York W3	18.10 21.95 26.30	Minnequa, Colo. C107.90 Minnequa, Colo. C109.	.50
Weitron.W.Va. W6	SparrowsPoint, Md. B27.325	Trenton, N.J. R5	18.10 21.95 26.30	N. Tonawanda, N.Y. B11.7.65 MuncieInd. I-79.	.50
STRIP, Hol-Roiled Inget Iron Ashland, Ky. (8) A 10 . 5.175 Warren, O. R2	Weirton, W. Va. W6 7.325	Youngstown J5	18.10 21.95 26.30 18.45 22.30 26.65	Palmer, Mass. W127.95 Palmer, Mass. (12) W129. Pittsburg, Calif. C118.60 Pittsburg, Calif. C1110.	25
SILICON SIEL  Armo- Elec- Warren, O. R2	10digstown 00, 11 ,020			Rankin.Pa. A77.65 Roebling, N.J. R59.	.60
Warren, O. R2		SILICON STEEL		S.SanFrancisco C108.60 S.SanFrancisco C1010.	25
BeechBottom, W. Va. W10	Ashland, Ky. (8) A105.175 Warren, O. R25.675	H.R. SHEETS(22 Ga., cut lengths) Fie		Sterling, Ill. (1) N15 7.65 Struthers, O. Y19.	30
Anderson, Ind. G6 7.15   Saltimore T6 7.15   Saltimore T6 7.15   Vandergrift, Pa. U. S. S. 9.625   11.10   11.80   12.90   13.95   Vandergrift, Pa. U. S. S. 9.625   11.10   11.80   12.90   13.95   Vandergrift, Pa. U. S.		BeechBottom, W. Va. W10	11.80 12.90 13.95	Struthers, O. Y17.65 Waukegan, Ill. A79.	30
Baltimore T6		Newport, Ky. A2 9.6	325 11.10 11.80 12.90 13.95	Waukegan, Ill. A77.65 Worcester A7, J4, T69.	60
Buffalo S40	Baltimore T67.15	Vandergrift.Pa. U5	11.10 11.80 12.90 13.95	WIRE, Gal'd ACSR for Cores Alton.Ill. Id	80
Carbothocken, Pa. A3 . 7.20   Dearborn, Mich. D3 . 7.25   Dearborn, Mich. D3 . 7.25   Detroit D2, M1, P20 . 7.25   Detroit D2, M1, P20 . 7.25   Dever, O. G6 . 7.15   Ecorse, Mich. G5 . 7.25   Evanston, III. M22 . 7.25   Evanston, III. M23 . 7.25   Follanshee, W. Va. F4 . 7.15   Ecorse, Mich. G5 . 7.25   Evanston, III. M22 . 7.25   Follanshee, W. Va. F4 . 7.15   Fontana, Calif. K1 . 9.00   FranklinPark, III. T6 . 7.25   IndianalPathor, Ind. 1. 2 . 9.625*11.05* 11.75* 12.65*   Muncie, Ind. 1. 7 . 12.85*   Johnstown, Pa. B2 . 12.65   Johnstown, Pa. B2 . 12.65	Buffalo S407.15 Cleveland A7 I5 7.15	Zanesville, O. A10 9.6	525 11.10 11.80 12.90 11.10 11.80 12.90 13.95	Buffalo W1212.65 Buffalo W1215.	.60
Dever, O. 66	Conchohookan Da A2 700	C.R. COILS & CUT LENGTHS (22	Ga.)	Cleveland A712.65 Chicago W1315. Donora, Pa. A712.65 Cleveland A715.	60
Evanston, Ill. M22 7.25 Evanston, Ill. M22 7.25 Follansbee, W. Va. F4 7.15 Fontana, Calif. K1 9.00 FranklinPark, Ill. 76 7.25 Ind. Harbor, Ind. Y1 7.15 Indianapolis J5 7.30 Los Angeles J5 9.05 Los Angeles J5 9.05 New Bedford, Mass. R10. 7.60 New Bertian(10) S15 7.15 New Haven, Conn. D2 7.60 New Bertian(10) S15 7.15 Pawtucket, R. I. R3 7.80 Pawtucket, R. I. R3 7.80 Pawtucket, R. I. R3 7.70 Philadelphia P24 7.70 Phil	Detroit D2, M1, P207.25	(Semiprocessed 1/2c lower) Fie	eld ture tric Motor mo	Johnstown, Pa. B212.65 Fostoria, O. S115	70 60
Foltans, Calif. K1 9.00 FranklinPark, Ill. T6 7.25 Ind. Harbor, Ind. Y1 7.15 Indianaphor, Ind. Y	Ecorse, Mich. G57.25	Brackenridge, Pa. A4	12.05 13.15 14.20	Minnequa, Colo. C1012.775 Houston S5	85
FranklinPark,Ill. T6 7.25 Ind.Harbor,Ind. Y1 7.15 Indianapolis J5 7.30 Los Angeles J5 9.05 Los Angeles C1 9.20 NewBedford,Mass. R10. 7.60 NewBritain(10) S15 7.15 NewCastle,Pa. B4, E5 7.15 NewHaven.Conn. D2 7.60 NewHaven.Conn. D2 7.60 NewHedet,R.I. R3 7.80 Pawtucket,R.I. R3 7.70 Pittsburgh J5 7.15 Rechabottom,Wa. W10 15.00 15.55 16.05 17.10 Pittsburgh J5 7.15 Rome,N.Y. (32) R6 7.15 Sharon,Pa. S3 7.15 Warren,O. R2 9.625*11.35 12.05 13.15 14.20 Portsmouth,O. P12 12.65 Monessen,Pa. P16 15.60 Portsmouth,O. P12 12.65 Monessen,Pa. P16 15.60 Portsmouth,O. P12 12.65 Monessen,Pa. P16 15.60 Muncie,Ind. T-7 15.80 Stator Struthers,O. Y1 12.65 Warkegan,Ill. A7 12.65 Worcester,Mass. A7 12.95 Worcester,Mass. A7 12.95 Worcester,Mass. A7 7.70 Wallsingford,Conn. W2 7.60 Wallingford,Conn. W2 7.60 Wallingford,Conn. W2 7.60 Warren,O. R2 12.05 Warren,O. R2 12.05 13.15 14.20 Portsmouth,O. P12 12.65 Monessen,Pa. P4 15.60 Muncie,Ind. T-7 15.60 Muncie,Ind. T-7 15.60 Warren,O. R2 12.75 Worcester,Mass. A7 12.95 Worcester,Mass. A7 12.95 Wallingford,Conn. W2 7.60 Wallingford,Conn. W2 7.60 Wallingford,Conn. W2 7.60 Warren,O. R2 15.60 Varren,O. R2 15.61 Varren,O. R2 15.61 Varren,O. R2 15.61 Varren,O. R2 15.65 Varren,O. R2 15.65 Varren,O. R2 16.60 17.60 19.20 19.70 20.20 15.25* Worcester,Mass. A7 7.70 Valuesery IS 17 7.15 Varren,O. R2 15.65 Varren,O. R2 16.60 17.60 19.20 19.70 20.20 15.25* Worcester,Mass. A7 7.70 Valuesery IS 17 7.15 Varren,O. R2 16.55* Varren,O. R2 16.60 17.60 19.00 Varren,O. R2 16.65 Varren,O. R2 16.60 17.60 19.00 Varren,O. R	Follanspee, W. Va. F47.15	GraniteCity, III. G4 9.8	325*11.05* 11.75* 12.85*	Muncle, Ind. I-712.85 Johnstown, Pa. B215.	60
Marren, O. R2	FranklinPark.Ill. T67.25	Mansfield, O. E6 9.6	325*11.35 12.05 13.15 14.20	Palmer, Mass. W1212.95 Kokomo, Ind. C1615.	60
Losangeles C1	Indianapolis J57.30	Warren, O. R2 9.6	325*11.35 12.05 13.15 14.20	Portsmouth, O. P1212.65 Monessen, Pa. P1615.	60
NewBedford, Mass. R10, 7.60 NewBritain (10) S15, 7.15 NewCastle, Pa. B4, E5, 7.15 NewHaven, Conn. D2, 7.60 NewKensington, Pa. A6, 7.15 Pawtucket, R.I. R3, 7.80 Pawtucket, R.I. R3, 7.80 Pawtucket, R.I. R3, 7.70 Pittsburgh J5, 7.15 Riverdale, Ill. A1, 7.25 Rome, N.Y. (32) R6, 7.15 Sharon, Pa. S3, 7.15 Sharon, Pa. S4, 7.70 Warren, O. R2  "Semiprocessed tfully processed only. tCoils, annealed, Worker, Pa. P7, P16, 9.30 Worcester, Mass. A7, 76, 15.60 Worcester, Mass. A7, 76, 15.90 Worcester, Mass. A7, 770 Worcester, Mass. A7, 770 NewHaven, Conn. D1, 13, 15, 15, 16.05  Sharon Pa. Struthers, O. 11 - 12.95 Wauklegan, Ill. A7, 12.95 Wauklegan, Ill.	LosAngeles C19.20			SparrowsPt., Md. B212.75 Palmer, Mass. W1215.	90 1
NewHavn.Conn. D2 . 7.60 NewKensington.Pa. A6 . 7.15 BeechBottom,W.Va., W10 . 15.00 15.55 16.05 17.10 NewKensington.Pa. A6 . 7.15 Pawtucket,R.I. R3 . 7.70 Pawtucket,R.I. R3 . 7.70 Philadelphia P24 . 7.70 Philadelphia P24 . 7.70 Pittsburgh J5 . 7.15 Riverdale,Ill. A1 . 7.25 Rome,N.Y.(32) R6 . 7.15 Sharon,Pa. S3 . 7.15 Sharon,Pa. S3 . 7.15 Wallingford,Conn. W2 . 7.60 Wallingford,Conn. W2 . 7.60 Warren.O. R2 . 7.5 Weirton, W.Va. W10 . 15.00 15.55 16.05 17.10 NewTensington,Pa. A6 . 7.15 Weirton, W.Va. W10 . 15.00 15.55 16.05 17.10 Novester,Mass. A7 . 12.95 Warren.O. R2 . 7.70 Novester,Mass. A7 . 12.95 Warren.O. R2 . 7.70 Novester,Mass. A7 . 12.95 Norcester,Mass. A7 . 12.95 Norcester,Mass. A7 . 12.95 Norcester,Mass. A7 . 12.95 Warren.O. R2 . 7.70 Novester,Mass. A7 . 7.10 Norcester,Mass. A7 . 12.95 Norcester,Mass.	NewBedford, Mass. R107.60 NewBritain(10) S157.15	Vandergrift, Pa. U5		Trenton, N.J. A712.95 Waukegan, Ill. A715.	60
NewKensington, Pa. 46, 7,15 Pawtucket, R.I. R3, 7,78 Pawtucket, R.I. R8, 7,70 Pawtucket, R.I. R8, 7,70 Philadelphia, P24	NewCastle, Pa. B4, E57.15 NewHaven, Conn. D27.60	H.R. SHEETS (22 Ga., cut lengths)	T-72 T-65 T-58 T-52	Worcester, Mass. A712.65 Worcester, Mass. A7, T6 15.	90
Pawtucket, R. I. N8	NewKensington,Pa. A67.15 Pawtucket,R.I. R37.80	Vandergrift, Pa. U5	. 15.00 15.55 16.05 17.10	WIRE, Upholstery Spring Bartonville, Ill. K412.	75
Riverdale, Ill. A1 7.25	Pawtucket, R.I. N87.70 Philadelphia P247.70	Zanesville, O. A10	15.00 15.55 16.05 17.10	Alton III. Id 9.50 Fostoria O S1 12	75
Rome, N.Y. (32) R6 7.15 Brackenridge, Pa. A4. 17.60 19.20 19.70 20.20 15.25† Duluth A7 9.30 Muncle, Ind. 1-7 12.95 Sharon, Pa. S3 7.15 Butler, Pa. A10 19.20 19.70 20.20 15.25† Duluth A7 9.30 Palmer, Mass. W12 13.05 Trenton, N.J. (31) R5 8.60 Vandergrift, Pa. U5 16.60 17.60 19.20 19.70 20.20 15.25* Wallingford, Conn. W2 7.60 Warren, O. R2 15.25† LosAngeles B3 10.25 SparrowsPt. Md. R2 12.85 Weirton, W.Va. W6 7.15 Weirton, W.Va. W6 7.15 Semiprocessed † Fully processed only. † Colls, annealed, Worcester, Mass. A7 7.70 Semiprocessed ½c lower. **Cut lengths, %-cent lower. New Haven, Conn. A7 9.60 (A) Plow and Mille Plow:	Pittsburgh J57.15	LENGTHS (22 Ga.) T-100 T-	-90 T-80 T-73 T-66 T-72	Cleveland A7 930 Monessen Po P7	75 75
Trenton,N.J.(31) R5860 Vandergrift,Pa. U5 . 16.60 17.60 19.20 19.70 20.20 15.25** KansasCity,Mo. S59.55 Rosping,N.J. R513.05 Warren,O. R2	Rome, N.Y. (32) R67.15	Brackenridge, Pa. A4 17	7.60 19.20 19.70 20.20 15.25++	Duluth A7	95 05
Warren, O. R., T.5	Trenton, N.J. (31) R58.60	Vandergrift, Pa. U5 . 16.60 17	7.60 19.20 19.70 20.20 15.25**	Johnstown, Pa. B29.30 Portsmouth, O. P1212. Kansas City, Mo. S59.55 Roseling N J R5	75 05
Worcester, Mass. A77.70 semiprocessed ½c lower. **Cut lengths, %-cent lower. New Haven, Conn. A79.60 (A) Plow and Mild Plow:	Warren, O. R2, T57.15			LosAngeles B310.25 SparrowsPt., Md. B212. Minnequa, Colo. C109.50 Struthers, O. Y112.	85 75
	Worcester, Mass. A77.70	semiprocessed ½c lower. **		Monessen, Pa. P7, P16 9.30 Worcester, Mass. J4 13. New Haven, Conn. A7 9.60 (A) Plow and Mild Ploy	05 w:
	roungstown Jo, 117.15	ficous only.			OW

WIRE, Tire Bead Bartonville, Ill. K416.55	Fairfield, Ala. T210.60	Crawf'dsville M8 17.25 19.05	Hex Nuts, Semifinished, Longer than 6 in.:
Monessen, Pa. P1616.55	Jacksonville, Fla. M811.16	Fostoria, O. S1 17.65 19.20† Houston S5 17.40 18.95**	Heavy (Incl. Slotted): % in. and smaller 8.0 % in. and smaller 60.5 %, %, and 1 in.
Roebling, N.J. R517.05 Wire, Cold-Rolled Flat	Johnstown, Pa. B210.60 Joliet, Ill. A710.60	Jacksonville M8.17.50 19.30	$\%$ in. to $1\frac{1}{2}$ in., diam + 6.0
Anderson, Ind. G611.65	KansasCity, Mo. S5 10.85	Johnstown B217.15 18.95§ Kan.City, Mo. S5 17.40	incl 55.5 High Carbon, Heat Treated: 1% in. and larger 53.5 6 in. and shorter:
Baltimore T611.95 Boston T611.95	Kokomo, Ind. C16 10.70 Los Angeles B3 11.40	Kokomo C1617.25 18.80† Minnequa C1017.40 18.95**	Hex Nuts, Finished (Incl. % in. and smaller 26.0 %, %, and 1 in.
Buffalo W1211.65	Minnequa, Colo. C1010.85 Pittsburg, Calif. C1111.40	P'lm'r, Mass. W12 17.45 19.00†	diam 3.0
Chicago W13		Pitts., Calif. C11.17.50 19.05† SparrowsPt. B2.17.25 19.05§	11/8 in. to 11/2 in., 5% in and smaller +13.0
Crawfordsville, Ind. M8.11.65 Dover, O. G611.65	S.SanFrancisco C1011.40 SparrowsPt., Md. B210.70 Sterling III (27) N15	Sterling (37) N15 17.25 19.05†† Waukegan A717.15 18.70†	incl 59.0 %, %, and 1 in. 1% in. and larger. 53.5 diam + 32.0
Fostoria, O. S1	Section (31) 141510.70	Worcester A717.45	Semifinished Hex Nuts, Reg. Flat Head Capscrews:
FranklinPark, Ill. T611.75 Kokomo, Ind. C1611.65	Coil No. 6500 Interim AlabamaCity, Ala, R2 \$10.65	WIRE, Merchant Quality (6 to 8 gage) An'ld Galv.	% in. and smaller 60.5 Setscraws, Square Head.
Massillon, O. R811.65 Milwaukee C2311.85	Atlanta A11	Ala.City, Ala. R2.8.65 9.20** Aliquippa J58.65 9.325§	% in. to 1 in., incl. 63.0 Cup Point, Coarse Thread: 1% in. to 1½ in., Through 1 in. diam.:
Monessen, Pa. P7, P1611.65	Bartonville, Ill. K4 10.75 Buffalo W12 10.65	Atlanta(48) A118.75 9.425*	incl 59.0 6 in. and shorter Net
Palmer, Mass. W1211.95 Pawtucket, R.I. N811.95	Chicago W1310.65 Crawfordsville, Ind. M8.10.75	Bartonville (48) K4 8.75 9.425 Buffalo W128.65 9.20†	CAP AND SETSCREWS
Philadelphia P2411.95 Riverdale, Ill. A111.75	Donora, Pa. A710.65	Cleveland A78.65 Crawfordsville M8 8.75 9.425	(Base discounts, packages, per cent off list, f.o.b. mill) F.o.b. Cleveland and/or
Rome, N.Y. R611.65	Duluth A7	Donora, Pa. A78.65 9.20+	Hex Head Capscrews, freight equalized with Pitts- Coarse or Fine Thread, burgh, f.o.b. Chicago and/or
Sharon, Pa. S311.65 Trenton, N.J. R511.95	Houston S510.90 Jacksonville, Fla. M811.21	Duluth A78.65 9.20† Fairfield T28.65 9.20†	Bright: freight equalized with Bir- 6 in. and shorter: mingham except where equal-
Warren, O. B911.65 Worcester, Mass. A7, T6 11.95	Johnstown, Pa. B210.65 Joliet, Ill. A710.65	Houston (48) S5 .8.90 9.45** Jacks' ville, Fla. M8 9.00 9.675	% in. and smaller 40.0 ization is too great.
NAILS, Stock Col. AlabamaCity, Ala. R2173	KansasCity, Mo. S510.90	Johnstown B2(48) 8.65 9.325 Joliet, Ill. A78.65 9.20†	%, %, and 1 in.       Structural ½ in., larger 12.25         diam.       22.0         ½ in. under: List less 19%
Aliquippa, Pa. J5173	Kokomo, Ind. C1610.75 Los Angeles B311.45	Kans.City(48) S5 8.90 9.45**	
Atlanta A11	Minnequa, Colo. C1010.90 Pittsburg, Calif. C1111.45	Kokomo C168.75 9.30† LosAngeles B39.60 10.275§	Not have a lawter delicer per 100 44 mills minimum
Chicago W13173	S.Chicago, Ill. R2 10.65	Minnequa C108.90 9.45** Monessen P7(48)8.65 9.325§	Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.
Cleveland A9	S.SanFrancisco C1011.45 SparrowsPt.,Md. B210.75	Palmer, Mass. W12 8.95 9.50† Pitts., Calif. C119.60 10.15†	In. Gage H.R. C.D. Elec. Weld
Donora, Pa. A7	Sterling, Ill. (37) N15 10.75 BALE TIES, Single Loop Col.	Rankin, Pa. A78.65 9.20†	1 13 25.98 23.54 1½ 13 30.78 23.36
Fairfield, Ala. T2173	AlabamaCity, Ala. R2212	S.Chicago R28.65 9.20** S.SanFran, C109.60 10.15**	$1\frac{1}{2}$ 13 29.03 34.01 25.83
Houston S5	Atlanta A11214 Bartonville, Ill. K4214	Spar'wsPt.B2(48) 8.75 9.4258	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
Johnstown, Pa. B2173 Joliet, Ill. A7173	Crawfordsville, Ind. M8214 Donora, Pa. A7212	Sterling (48) N15 8.90 9.575†† Sterling (1) (48) .8.80 9.475††	$2\frac{1}{4}$ 13 43.29 50.75 38.52 $2\frac{1}{4}$ 12 46.99 55.06 41.81
KansasCity, Mo. S5178 Kokomo, Ind. C16175	Duluth A7212	Struthers, O. Y1 8.65 9.30‡ Worcester, Mass. A7 8.95 9.50†	2½ 12 51.76 60.65 46.05
Minnequa, Colo, C10178 Monessen, Pa. P7173	Fairfield, Ala. T2212 Houston S5217		$2\frac{3}{4}$ 12 56.04 65.67 49.88 3 12 59.76 70.03 53.19
Monessen, Pa. P7173 Pittsburg, Calif. C11192	Jacksonville, Fla. M8219 Joliet, Ill. A7212	Based on zinc price of: *13.50. †5c. \$10c. ‡Less	BALLWAY MARPHALC
Rankin, Pa. A7	KansasCity, Mo. S5217	than 10c. ††10.50c. **Subject to zinc equalization extras.	RAILWAY MATERIALS
SparrowsPt.,Md. B2175	Kokomo, Ind. C16214 Minnequa, Colo. C10217		Standard——Tee Rails All 60 lb
Sterling, Ill. (7) N15175 Worcester, Mass. A7179	Pittsburg, Calif. C11236 S. San Francisco C10236	FASTENERS (Base discounts, full con-	Rails No. 1 No. 2 No. 2 Under Bessemer, Pa. U5 5.525 5.425 6.50
(To Wholesalers; per cwt)	SparrowsPt.,Md. B2214	tainer quantity, per cent off	Ensley, Ala. T2 5.525 5.425 6.50 Fairfield, Ala. T2 6.50
Galveston, Tex. D7\$9.10  NA!LS, Cut (100 lb keg)	Sterling, Ill. (7) N15214 FENCE POSTS	list, f.o.b. mill) BOLTS	Gary, Ind. U5 5.525 5.425
To Dealers (33)	Birmingham C15172	Carriage, Machine Bolts	Huntington, W. Va. C15 5.525 5.425 5.475
Conshohocken, Pa. A3\$9.80 Wheeling, W. Va. W109.80	ChicagoHts., Ill. C2, I-2172 Duluth A7172	Full Size Body (cut thread) ½ in. and smaller:	Johnstown, Pa. B2 5.525 5.425 6.50
POLISHED STAPLES Col. AlabamaCity, Ala. R2175	Franklin, Pa. F5172 Huntington, W. Va. C15172	6 in. and shorter 49.0 Longer than 6 in 39.0	Minnequa, Colo. C10 5.525 5.425 7.00
Aliquippa, Pa. J5175	Johnstown, Pa. B2172	% in. thru 1 in.:	Steelton, Pa. B2 5.525 5.425 Williamsport, Pa. S19 6.50
Atlanta A11177 Bartonville,Ill. K4177	Marion, O. P11	6 in. and shorter 39.0 Longer than 6 in 35.0	TIE PLATES TRACK BOLTS, Untreated
Crawfordsville, Ind. M8 177 Donora, Pa. A7	Sterling, Ill. (1) N15172 Tonawanda, N.Y. B12174	1% in. and larger: All lengths 35.0	Gary, Ind. U56.60 Kansas City, Mo. S514.75
Duluth A7175	WIRE, Barbed Col.	Undersized Body (rolled	Ind. Harbor, Ind I-26.60 Lebanon, Pa. B214.75 Lackawanna, N.Y. B26.60 Minnequa, Colo. C1014.75
Fairfield, Ala. T2175 Houston S5180	AlabamaCity, Ala. R2193** Aliquippa, Pa. J5190§	thread) ½ in. and smaller:	Minnegua Colo. C106.60 Pittsburgh P14 14 75
Jacksonville, Fla. (20) M8 186 Johnstown, Pa. B2175	Atlanta A11198* Bartonville,Ill. K4198	Carriage, Machine, Lag Bolts	Steelton, Pa. B26.60
Joliet, Ill. A7	Crawfordsville, Ind. M8 198 Donora, Pa. A7 193†	Hot Galvanized: ½ in. and smaller:	Lebanon, Pa. B214.50
Kokomo, Ind. C16177	Duluth A7	6 in. and shorter 29.0	Bessemer, Pa. U56.975 STANDARD TRACK SPIKES
Minnequa, Colo. C10180 Pittsburg, Calif. C11194	Fairfield, Ala. T2193† Houston S5198**	Longer than 6 in 15.0 % in. and larger:	Fairfield, Ala. T26.975 Fairfield, Ala. T29.75 Ind. Harbor, Ind. I-26.975 Ind. Harbor, Ind. I-2, Y1 9.75
Rankin, Pa. A7	Jacksonville, Fla. M8203 Johnstown, Pa. B2196§	All lengths 12.0 Lag Bolts (all diam.)	Joliet.Ill. U56.975 KansasCity, Mo. S59.75
SparrowsPt., Md. B2177	Joliet, Ill. A7193†	6 in. and shorter 49.0 Longer than 6 in 39.0	Lackawanna, N.Y. B26.975 Lebanon, Pa. B29.75 Minnequa, Colo. C106.975 Minnequa, Colo. C109.75
Sterling, Ill. (7) N15175 Worcester, Mass. A7181	KansasCity, Mo. S5198** Kokomo, Ind. C16195†	Plow and Tap Bolts	Steelton, Pa. B26.975 Pittsburgh J59.75 Seattle B310.25
TIE WIRE, Automatic Baler	Minnequa, Colo. C10 198** Monessen, Pa. P7 196§	½ in. and smaller by 6 in. and shorter 49.0	AXLES S.Chicago, Ill. R29.75
(14½ Ga.)(Per 97 lb Net Box) Coil No. 3150	Pittsburg, Calif. C11213† Rankin, Pa. A7193†	Larger than ½ in. or longer than 6 in 39.0	Ind. Harbor, Ind. S138.775 Struthers, O. Y19.75 Johnstown, Pa. B28.775 Youngstown R29.75
AlabamaCity, Ala. R2.\$10.26 Atlanta A1110.36	C Chicago III R2 193**	Blank Bolts 39.0	
Bartonville, Ill. K410.36	S.SanFrancisco C10213** SparrowsPoint, Md. B21988	Stove Bolts, Slotted:	(1) Chicago base, (25) Bar mill bands,
Buffalo W1210.26 Chicago W1310.26	Sterling, Ill. (7) N15 19877	% to ¼ in. incl., 3 in. and shorter. 55.0	(3) Merchant. (28) Ronderized
Crawfordsville, Ind. M8.10.36 Donora, Pa. A710.26	WOVEN FENCE, 9-15 Ga. Col. Ala.City, Ala. R2187**	sive 55.0	(4) Reinforcing. (29) Youngstown base.
Duluth A7	Aliq'ppa,Pa.9-14½ga.J5 190§ Atlanta A11192*	NUTS	1 7/16 to under 1 15/16 in., add 0.45c. 6.70c; 1 15/16 to 8 in., (31) Widths over 56 in 7 80c.
Houston S5	Bartonville, Ill. K4192	Reg. & Heavy Square Nuts: All sizes 55.5	(6) Chicago or Birm, base, for widths % in, and under
Jacksonville, Fla. M810.82 Johnstown, Pa. B210.26	Crawfordsville, Ind. M8192 Donora, Pa. A7187†	Square Nuts, Reg. &	(8) 16 Ga. and heavier. (32) Buffalo base.
Joliet, Ill. A7	Duluth A7	All sizes 41.0	
Kokomo, Ind. C1610.36	Houston S5192**  Jacksonville, Fla. M8197	Hex Nuts, Reg. & Heavy, Hot Pressed:	(10) Pittsburgh base. (11) Cleveland & Pitts, base. (12) Warneyder, Mass, base. (13) 54" and narrower.
LosAngeles B311.05 Minnequa, Colo. C1010.51	Johnstown, Pa. (43) B2 190§	% in. to 1 in., incl. 55.5	(12) Worcester, Mass. base. (13) Add 0.25c for 17 Ga. & (37) Chicago base, 10 points
Pittsburg, Calif. C1111.04 S.Chicago, Ill. R210.26	Joliet, Ill. A7187† Kansas City, Mo. S5192**	1% in. to 1½ in.,	(14) Gage 0.143 to 0.249 in.; (38) 14 Ga. & lighter; 48" & narrower.
S.SanFrancisco C1011.04	Kokomo, Ind. C16189† Minnequa, Colo. C10192**	1% in. and larger 53.5	(39) 48" and narrower.
SparrowsPt., Md. B210.36 Sterling, Ill. (37) N1510.36	Pittsburg, Calif. C11210†	Hex Nuts, Reg. & Heavy, Cold Punched:	(16) 40 lb and under. 0.055° and neavier, 0.250 higher.
Coil No. 6500 Stand.	Rankin, Pa. A7187† S. Chicago, Ill. R2187**	% in, and smaller 60.5	heavier. (41) 9.10c for cut lengths, (42) Mill lengths, f.o.b. mill:
AlabamaCity, Ala. R2 .\$10.60 Atlanta A1110.70	Sterling, Ill. (7) N15 192††	1% in. and larger 53.5	(19) Chicago & Pitts, base. deld, in mill zone or within switching limits, 5.6850.
Bartonville, Ill. K410.70 Buffalo W1210.60	An'ld Galv.	Hex Nuts, All Types,	(40) I lus 10 per 100 m. (42) 0 141/ Co.
CINCOLOR TETA 2 10 60	WIRE (16 gage) Stone Stone	Hot Galvanized:	(21) New Haven, Com. Dase. (10) 511/2 Ga.
Chicago W1310.60	Wire (16 gage) Stone Stone Ala.City, Ala.R2 17.15 18.70**	<ul> <li>34 in. and smaller 46.5</li> <li>36 in. to 1 in., incl. 41.5</li> </ul>	(21) New Haven, Comm. base. (22) Deld. San Francisco Bay (44) To fabricators. area. (43) Speeds quality. (49) 3½ in. and smaller rounds;
Crawfordsville, Ind. M8.10.70	Wire (16 gage) Stone Stone Ala.City, Ala.R2 17.15 18.70** Aliq'ppa, Pa. J5 .17.15 18.95 Bartonville K4 .17.25 19.05	% in. and smaller 46.5 % in. to 1 in., incl. 41.5 1% in. to 1½ in.,	(21) New Haven, Colm. base. (22) Deld. San Francisco Bay (44) To fabricators. (48) 6-7 Ga. (23) Special quality. (24) Deduct 0.15c, finer than (24) Deduct 0.15c, finer than
Crawfordsville, Ind. M8.10.70	Wire (16 gage) Stone Stone Ala.City, Ala.R2 17.15 18.70**	% in. and smaller 46.5 % in. to 1 in., incl. 41.5 1% in. to 1½ in.,	(21) New Haven, Colm. base. (22) Deld. San Francisco Bay (44) To fabricators. (48) 6-7 Ga. (23) Special quality. (24) Deduct 0.15c, finer than (24) Deduct 0.15c, finer than

Ambridge, Pa. N2 + 9.25 + Lorain, O. N3 + 9.25 + 24.25 +	2½ 58.5c 5.82 <b>Blk Galv*</b> 2.75 + 19.5 + 2.75 + 19.5 +	Carload 3 76.5c 7.62 Blk Galv* 0.25 +17 0.25 +17 0.25 +17 0.25 +17	discounts from li $3\frac{1}{2}$ $92c$ $92c$ $9.20$ <b>Blk Galv*</b> $1.25 + 15.5$ $1.25 + 15.5$ $1.25 + 15.5$	st, %  \$1.09 10.89 Blk Galv* 1.25 +15.5 1.25 1.25 +15.5 1.25 + 15.5	5 \$1.48 14.81 Blk Galv* 1 +15.75 1 1 +15.75 1 +15.75	6 \$1.92 19.18 <b>Bik Gaiv*</b> 3.5 +13.25 3.5 +13.25 3.5 +13.25
ELECTRIC STANDARD PIPE, Threaded Youngstown R2 + 9.25 + 24.25 +	and Coupled -2.75 +19.5 +	Carload 0.25 +17	discounts from 1: 1.25 +15.5	ist, % 1.25 + 15.5	1 + 15.75	3.5 + 13.25
Alton, Ill. L1  Benwood, W. Va. W10 4.5 + 22  Butler, Pa. F6 5.5 + 21  Etna, Pa. N2  Fairless, Pa. N3  Fontana, Calif. K1  Indiana Harbor, Ind. Y1  Lorain, O. N3  Sharon, Pa. S4 5.5 + 21  Sharon, Pa. M6  Sparrows Pt., Md. B2. 3.5 + 23  Wheatland, Pa. W9 5.5 + 21	14 6c 0.42 Blk Galv*  17.5 + 31 + 1 16.5 + 30 + 1  18.5 + 32 + 1 18.5 + 32 + 1 18.6 + 30 + 1	% 6c 0.57 Blk 439.5 17 +38.5 17 +38.5	discounts from 1:	ist, % $ \begin{array}{c} 34 \\ 11.5c \\ 1.13 \\ \textbf{Blk} \\ 8.25 \\ +6 \\ 6.25 \\ +8 \\ 8.25 \\ +6 \\ \dots \\ 1.25 \\ +6 \\ 6.25 \\ +8 \\ 45.25 \\ +19.5 \\ 7.25 \\ +7 \\ 8.25 \\ +6 \\ 1.$	$\begin{array}{c} 1\\ 17c\\ 1.68\\ \textbf{Blk} & \textbf{Galv}^*\\ 11.75 & +1.5\\ 9.75 & +3.5\\ 11.75 & +1.5\\ \dots\\ 11.75 & +1.5\\ 9.75 & +3.5\\ +1.75 & +1.5\\ 10.75 & +2.5\\ 11.75 & +1.5\\ \dots\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ 11.75 & +1.5\\ \end{array}$	$\begin{array}{c} 114\\ 23c\\ 2.28\\ \text{Blk} & \text{Galv*}\\ 14.25 & +0.75\\ 12.25 & +2.75\\ 14.25 & +0.75\\ 12.25 & +2.75\\ 0.75 & +14.25\\ 13.25 & +3.25\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ 14.25 & +0.75\\ \end{array}$
Size—Inches         1½           List Per Ft         27.5c           Pounds Per Ft         27.5c           Blk         Gal           Aliquippa, Pa, J5         14.75         0.2           Alton, Ill. L1         12.75         1.7.           Benwood, W. Va. W10         14.75         0.2           Etna, Pa. N2         14.75         0.2           Fairless, Pa. N3         12.75         +1.7           Fontana, Calif. K1         1.25         +13.2           Indiana Harbor, Ind. Y1         13.75         +0.7           Lorain, O. N3         14.75         0.2           Sparrows Pt., Md. B2         12.75         +1.7           Wheatland, Pa. W9         14.75         0.2           Youngstown R2, Y1         14.75         0.2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	.75 14.7 .75 16.7 .25 18.7 .75 14.7 .25 3.2 .25 3.2 .75 15.7 .75 16.7 .25 16.7 .75 16.7	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	3½ 92c 9.20 Blk Galv* 6.25 + 10.5 6.25 + 12.5 + 7.25 + 24 5.25 + 11.5 4.25 + 12.5 6.25 + 10.5 6.25 + 10.5 6.25 + 10.5	\$1.09 10.89 Blk Galv*  6.25 + 10.5 6.25 + 10.5 4.25 + 12.5 +7.25 + 24 5.25 + 11.5  4.25 + 12.5 6.25 + 10.5 6.25 + 10.5

Stainless Steel

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Representative	prices.	cents	per	nound:	subject	to	current	lists r	of.	extras	

\*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

AISI	Danie	olling—-	Forg-	11.0	H.R. Rods;	Bars; Struc-			C.R. Strip; Flat
Type	Ingot	Siabs	ing Billets	H.R. Strip	C.F. Wire	tural Shapes	Plates	Sheets	Wire
201	22.00	27.00		36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.25
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303		32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L			48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309		49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314			77.50		86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L		55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88,25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330			106.75		95.25	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.7 <b>5</b>	63.50	61.50	64.75	69.75	79.25	79.25
403			32.00		35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416			28.75		32.50	34.25	36.00	48.25	48.25
420		33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430		21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F			29.50		33.00	34.75	36.75	51.75	42.00
431		28.75	37.75		42.00	44.25	46.00	56.00	56.00
446			39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armoo Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co. Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Simonds Saw & Steel Co.; Superior Tube Co.; Sweptor Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ubrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

#### Clad Steel

			PI	ates		Sheets
			Carbon			Carbon Base
		5%	10%	15%	20%	20%
,	Stainless	0 ,0	10 /0			20 //
	302					37.50
	304	34.70	37.95	42.25	46.70	39.75
)	304L	36.90	40.55	45.10	49.85	00.10
1	316	40.35	44.50	49.50	54.50	58.25
1	316L	45.05	49.35	54.70	60.10	00.20
۱	316 Cb	47.30	53.80	61.45	69.10	* * * *
	0.04	36.60	40.05	44.60	49.30	47.25
	0.18					
	347	38.25	42.40	47.55	52.80	57.00
	405	28.60	29.85	33.35	36.85	
	410	28.15	29.55	33.10	36.70	
)	430	28.30	29.80	33.55	37.25	
,	Inconel	48.00	59.55	70.15	80.85	
)	Nickel	41.65	51.95	62.30	72.70	
)	Nickel, Low Carbon	41.95	52.60	63.30	74.15	
	Monel	43.35	53.55	63.80	74.05	
)	Copper*					46.00
)						
)					Strip	Carbon Base
)						old Rolled-
)					10%	Both Sides
Ď	Commany					
5	Copper*				33.10	38.75

\*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

#### Tool Steel

4

e			-				
; w ; n	Regular Extra ( Special	Carbon Carbon Carbon	0. 0.	305 360 475	Cr-Hot V W-Cr Ho V-Cr Ho	Work t Work t Work on-Cr	0.500 0.520
el		Grade	by And	ılysis (%)			
,,	W	Cr	V	Co	Mo	5	per lb
n ı-	20.25	4.25	1.6	12.25			
	18.25	4.25	1	4.75			2,500
;	18	4	2	9			2.870
9	18	4	2				1.960
; h	1.8	4	1				1.795
11	9	3.5					1.395
	13.5	4	3				2.060
el	13.75	3.75	2	5			2,440
	0.4	4.5	1.9		5		1,300
;	6	4	3		0		

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

8.5

#### Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to Steel. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

Pinningham District	Basic	No. 2 Foundry	Malle- able	Besse- mer	No. 2 Malle- Besse- Basic Foundry able mer
Birmingham District					Duluth I-3 66.00 66.50 66.50 67.00
Birmingham R2	62.00	62.50‡			Erie, Pa. I-3
Birmingham U6		62.50‡	66.50		Everett, Mass. E1 67.50 68.00 68.50
Woodward, Ala. W15	62.00**	62.50‡	66.50		Fontana, Calif. K1 75.00 75.50
Cincinnati, deld.		70.20			Geneva, Utah C11
Buffalo District					GraniteCity, Ill. G4
T) 44 7 Hay					Ironton, Utah C11 66.00 66.50
N. Tonawanda, N. Y. T9	66.00	66.50	67.00	67.50	Minnequa, Colo. C10
Tonawanda, N.Y. W12	66,00	66.50	67.00	67.50	Rockwood, Tenn. T3 62.50‡ 66.50 Toledo, Ohio I-3 66.00 66.50 66.50 67.00
Boston, deld.	77 20	66.50 77.79	67.00 78.29	67.50	Cincinnati 3-13
Rochester, N.Y., deld.	69.02	69.52	70.02		Cincinnati, deld 72.54 73.04
Syracuse, N.Y., deld.	70.12	70.62	71.12		**Phos. 0.70-0.90%; Phos. 0.30-0.69%, \$63.
	, , , ,	10.02	11.12	* * * *	‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, \$63.50.
Chicago District					
Chicago I-3	66.00	66.50	66.50	67.00	PIG IRON DIFFERENTIALS
S.Chicago, Ill. R2	66.00	66.50	66.50	67.00	Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof
S.Chicago, Ill. W14	66.00		66.50	67.00	over base grade, 1.75-2.25%, except on low phos. iron on which base
Milwaukee, deld. Muskegon, Mich., deld.	69.02	69.52	69.52	70.02	IS 1.75-2.00%.
and the Bott, Miletti, deld,		74.52	74.52		Manganese: Add 50 cents per ton for each 0.25% manganese over 1%
Cleveland District					or portion thereof.
Cleveland R2, A7	66.00	66.50	00 50	67.00	Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add \$2 per ton and each additional 0.25%, add \$1 per ton.
Akron, Ohio, deld.	69.12	69.62	66.50 69.62	67.00 70.12	and the determination of the per ton.
	00.12	00.02	05.02	10.12	BLAST FURNACE SILVERY PIG IRON, Gross Ton
Mid-Atlantic District					(Base 6.00-6.50% silicon; add \$1 for each 0.50% silicon or portion
Birdsboro, Pa. B10	68.00	68.50	69.00	69.50	thereof over the base grade within a range of 6.50 to 11.50%; starting
Chester, Pa. P4	68.00	68.50	69.00		with silicon over 11.50% add \$1.50 per ton for each 0.50% silicon or
Swedeland, Pa. A3	68.00	68.50	69.00	69.50	portion thereof up to 14%; add \$1 for each 0.50% Mn over 1%)
NewYork, deld.	70.00	75.50	76.00		Jackson, Ohio I-3, J1
Newark, N.J., delà	70.41	73.19 70.91	73.69 71.41	74.19 71.99	Buffalo H1 79.25
Troy, N.Y. R2	68.00	68.50	69.00	69.50	ELECTRIC FURNACE SILVERY IRON, Gross Ton
	00.00	00.00	05.00	02.00	
Pittsburgh District					(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1.25 for each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max P)
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00	CalvertCity, Ky. P15 \$99.00
Pittsburgh (N&S sides),					NiagaraFalls,N.Y. P15 99.00
Aliquippa, deld		67.95	67.95	68.48	Keokuk, Iowa Open-hearth & Fdry, \$9 freight allowed K2 103.50
McKeesRocks, Pa., deld		67.60	67.60	68.13	Keokuk, Iowa O.H. & Fdry, 121/2 lb piglets, 16% Si, max fr'gt
Lawrenceville, Homestead,		00.00	20.00	80 =0	allowed up to \$9, K2 106.50
Wilmerding, Monaca, Pa., deld Verona, Trafford, Pa., deld	68.29	68.26 68.82	68.26 68.82	68.79 <b>69.35</b>	LOW PHOSPHORUS PIG IRON, Gross Ton
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63	
Midland, Pa. C18	66.00	00.10	05.10	03.00	Lyles, Tenn. T3 (Phos. 0.035% max)
					Rockwood, Tenn. T3 (Phos. 0.035% max)       78.50         Troy, N.Y. R2 (Phos. 0.035% max)       74.00
Youngstown District					Philadelphia, deld
Hubbard, Ohio Y1			66.50		Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max) 71.00
Sharpsville, Pa. S6	66.00		66.50	67.00	Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max) 71.00
Youngstown Y1			66.50	67.00	Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max) 71.00
Mansfield, Ohio, deld	70.90		71.40	71.90	NevilleIsland, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max) 71.00

#### **Warehouse Steel Products**

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS			STRIP	STRIF BARS			Standard ——PLA		TE C	
	Hot- Rolled	Cold- Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot- Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††5	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.865		.,,,,,,	8.64	9.01	10.68		9.05	8.97	10.90
Baltimore Birmingham Boston	8.28 8.18 9.38 8.40	8.88 9.45 10.44 9.00	9.78 11.07 11.45 10.07	53.50 55.98	8.76 8.23 9.42 8.50	9.06 8.60 9.73 8.80	11.34 # 10.57 12.90 # 10.90 #	15.18 15.28 15.00	9.19 8.64 9.63 8.90	8.66 8.56 9.72 8.90	10.14 10.70 11.20 10.45
Chattanooga Chicago Cincinnati Cleveland	8.35 8.20 8.34 8.18	9.69 9.45 9.48 9.45	9.65 10.10 10.10 10.20	53.00 52.43 52.33	8.40 8.23 8.54 8.33	8.77 8.60 8.92 8.69	10.46 8.80 9.31 10.80#	14.65 14.96 14.74	8.88 8.64 9.18 9.01	8.80 8.56 8.93 8.79	10.66 9.88 10.21 10.11
Dallas Denver Detroit	8.85 9.38 8.43	10.15 11.75 9.70	10.45	56.50	9.00 9.41 8.58	8.95 9.78 8.90	11.01 11.10 9.15	14.91	9.00 9.82 9.18	9.45 9.74 8.91	10.70 11.06 10.13
Erie, Pa	8.20	9.45	9.9510		8.50	8.75	$9.05^{10}$		9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	7.70	8.95
Jackson, Miss	8.52	9.79		* * * *	8.57	8.94	10.68		8.97	8.90	10.74
Los Angeles	8.50	10.75	11.65	57.60	8.55	8.55	12.00		8.60	8.55	9.95
Memphis, Tenn. Milwaukee Moline, Ill	8.55 8.33 8.55	9.80 9.58 9.80	10.23 10.35	• • • •	8.60 8.36 8.58	8.97 8.73 8.95	11.96# 9.03 9.15	14.78	9.01 8.85 8.99	8.93 8.69 8.91	10.56 10.01
New York Norfolk, Va	8.87 8.40	10.13	10.56	53.08	9.31 9.10	9.57 9.10	12.76# 12.00	15.09	9.35 9.40	9.43 8.85	10.71 10.35
Philadelphia Pittsburgh Portland, Oreg.	8.00 8.18 8.50	8,90 9,45 11,20	9.92 10.45 11.55	52.69 52.00 57.38	8.67 8.33 9.55	8.65 8.60 8.65	11.51 # 10.80 # 14.50	15.01 14.65 15.95	8.50 8.64 8.65	8.75 8. <b>56</b> 8. <b>30</b>	9.75** 9.88 11.50
Richmond, Va	8.40		10.40		9.10	9.00			9.40	8.85	10.35
St. Louis St. Paul San Francisco Seattle South'ton, Conn. Spokane	8.54 8.79 9.35 9.95 9.07 9.95	9.79 10.04 10.75 11.15 10.33 11.15	10.46 10.71 11.00 12.00 10.71 12.00	55.10 57.38 57.38	8.59 8.84 9.45 10.00 9.48 10.00	8.97 9.21 9.70 10.10 9.74 10.10	9.41 9.66 13.00 14.05 14.05	15.01 16.10 16.35 17.20	9.10 9.38 9.50 9.80 9.57 9.80 9.79	8.93 9.30 9.60 9.70 9.57 9.70	10.25 10.49 12.00 12.10 10.91 12.10
Washington	8.88				9.36	9.56	10.94		0.10	0.20	70.17

\*Prices do not include gage extras; †prices include gage and coating extras; †includes 35-cent bar quality extras; §42 in. and under; \*\*½ in. and heavier; ††as annealed; ftover 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; 3—400 to 9999 lb; 5—1000 to 1999 lb; 8—2000 to 3999 lb; 10—2000 lb and over.

151

#### Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward,
Hitchins, Haldeman, Olive Hill, Ky., Athens,
Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West
Decatur, Winburne, Snow Shoe, Pa., Bessemer,
Ala., Farber, Mexico, St. Louis, Vandalia, Mo.,
Ironton, Oak Hill, Parral, Portsmouth, Ohio,
Ottawa, Ill., Stevens Pottery, Ga., \$135;
Salina, Pa., \$140; Niles, Ohio, \$138; Cutler,
Utah, \$165.
Super-Duty: Ironton, Ohio, Vandalia, Mo.,
Olive Hill, Ky., Clearfield, Salina, Winburne,
Snow Shoe, Pa., New Savage, Md., St. Louis,
\$175; Stevens Pottery, Ga., \$185; Cutler, Utah,
\$233.

\$233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., \$150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., \$155; E. Chicago, Ind., Joliet, Rockdale, Ill., \$160; Lehigh, Utah, \$175; Los Angeles, \$180.

Rockate, 11., \$100, Lenigh, Otah, \$170, Los Angeles, \$180. Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., \$157; Morrisville, Hays, Latrobe, Pa., \$169; E. Chicago, Ind., \$167; Curtner, Calif.,

Semisilica Brick (per 1000)
Clearfield, Pa., \$140; Philadelphia, \$137; Woodbridge, N. J., \$135.

Ladle Brick (per 1000)
Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, \$96.75; Clearfield, Pa. Portsmouth, Ohio, \$102.

High-Alumina Brick (per 1000)
50 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$235; Danville, Ill., \$238; Philadelphia, Clear-

field, Pa., \$230; Orviston, Snow Shoe, Pa.,

\$245.
60 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$295; Danville, Ill., \$298; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., \$305.
70 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$335; Danville, Ill., \$338; Philadelphia, Clearfield, Orviston, Snow Shoe, Pa., \$345.

Sleeves (per 1000)

Johnstown, Bridgeburg, Pa., St. Reesdale, Jouis, \$188.

Nozzles (per 1000)

Johnstown, Bridgeburg, Pa., St. Reesdale. Louis, \$310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, 516.75; Thornton, McCook, Ill., \$17; Dolly Siding, Bonne Terre, Mo., \$15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., \$46; % in. grains with fines: Baltimore, \$73.

#### Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content 72.5%, \$37-41; 70%, \$36.40; 60%, \$33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, \$33-34; Mexican, all rail, duty paid, \$25.25-25.75; barge, Brownsville, Tex., \$27.25-27.75

#### Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Sponge Iron, Swedish:
Deld. east of Mississippi River, ocean bags
23,000 lb and over.. 10.50
F.o.b. Riverton or
Camden, N. J., west of Mississippi River. 9.50

Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over 10.50

Annealed, 99.5% Fe.. 36.50 Unannealed (99 + % Fe) ..... 36.00 Unannealed (99 + % Fe) (minus 325 mesh) .......... 59.00

Powder Flakes (minus 16, plus 100 mesh).. 29.00 Carbonyl Iron:

arbonyl fron:
98.1-99.9%, 3 to 20 microns, depending on
grade, 93.00-290.00 in
standard 200-1b containers; all minus 200 mesh.

Aluminum:
Atomized, 500-lb
drum, freight allowed
Carlots 39.50
Ton lots 41.50
Antimony, 500-lb lots 42.00
Brass, 5000-lb
lots30.30-45.70

Bronze, 5000-lb lots .......45.70-49.80† Electrolytic .....14.75°

Zinc, 5000-lb lots 17.50-30.70:

Tungsten: Dollars
Melting grade, 99%
60 to 200 mesh, to 200 mesh, nominal; 1000 lb and over.. 3.15 Less than 1000 lb .. 3.30 Chromium, electrolytic 99.8% Cr min

\*Plus cost of metal. †Depending on composition. Depending on mesh.

metallic basis .... 5.00

#### Electrodes

Threaded with nipple; un-boxed, f.o.b. plant

#### GRAPHITE

Inch	es	Per
Diam		100 lb
2	24	\$60.75
21/2	30	39.25
3	40	37.00
4	40	35.00
51/8	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00
	CAPPON	

#### CARBON

8		60	13.30
10		60	13.00
12		60	12.95
14		60	12.85
14		72	11.95
17		60	11.85
17		72	11.40
20		84	11.40
20		90	11.00
24		72, 84	11.25
24		96	10.95
30		84	11.05
40	35	110	10.70
40		100	10.70

#### Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental Function of countries.)

and the second s		continental	r.m.obesu	countries.)
	North	South	Gulf	West
	Atlantic	Atlantic	Coast	Coast
Deformed Bars, Intermediate, ASTM-A 305	\$5.53	\$5.33	\$5.33	\$5.73
Bar Size Angles	5.73	5.58	5.58	5.99
Structural Angles	5.73	5.58	5.58	5.99
1-Deams	5.88	5.72	5.72	6.02
Channels	5.88	5.72	5.72	6.02
Plates (basic bessemer)	6.79	6.62	6.62	6.94
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	
Furring Channels, C.R., 1000 ft, 34 x 0.30 lb	9.00	8.99	8.95	9.25
ner ft	OF EN	05.50		
per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.23	6.07	6.07	6.43
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20
	01010	0.0=	4.02	0.20

†Per 82 lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

#### Ores

Lake Superior Iron Ore
(Prices effective for the 1958 shipping season
gross ton, 51.50% iron natural, rall of vessel
lower lake ports.)
Mesabi bessemer\$11.60
Megahi nonhessemer
Old Range bessemer
Old Range nonbessemer
Open-hearth lump 12.70
High phos
The foregoing prices are based on upper lake
rail freight rates, lake vessel freight rates,
rall freight rates, lake vessel freight total
handling and unloading charges, and taxes
thereon, which were in effect Jan. 30, 1957,
and increases or decreases after that date are
absorbed by the seller.
Eastern Local Iron Ore

points

Before duty.

48%	3:1 \$50.00					
48%	2.8:1 48.00					
48%	no ratio 39.00					
	South African Transvaal					
48%	no ratio\$37.00					
	no ratio 27.00					
	Turkish					
48%	3:1 \$55.00					
	Domestic					
	Rail nearest seller					
18%	3:1					
Molybdenum						
	de concentrate, per lb of Mo content,					

#### **Metallurgical Coke**

Beehive Ovens
Connellsville, Pa., furnace\$14.75-15.75
Connellsville, Pa., foundry18.00-18.50
Oven Foundry Coke
Birmingham, ovens\$28.85
Cincinnati, deld 31.84
Buffalo, ovens 30.50
Camden, N. J., ovens 29.50
Detroit. ovens 30.50
Pontiac, Mich., deld 32.45
Saginaw, Mich., deld 34.03
Erie, Pa ovens 30.50
Everett, Mass., ovens:
New England, deld31.55*
Indianapolis, ovens
Ironton, Ohio, ovens
Cincinnati, deld 31.84
Kearny, N. J., ovens
Milwaukee, ovens
Painesville, Ohio, ovens
Cleveland, deld 32.69
Philadelphia, ovens
St. Louis, ovens 31.50
St. Paul, ovens
Chicago, deld 33.29
Swedeland, Pa., ovens 29.50
Terre Haute, Ind., ovens 29.75

Or within \$4.85 freight zone from works.

#### Coal Chemicals

Pure benzene 36.00
30.00
Toluene, one deg
Industrial xylene32.00-34.00
Per ton, bulk, ovens
Ammonium sulfate\$32.00-34.00
Cents per pound, producing point
Phenol: Grade 1, 17.50; Grade 2-3, 15.50;
Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Spot, cents per gallon, ovens



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#### **Ferroalloys**

#### MANGANESE ALLOYS

**Spiegeleisen:** Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, \$105; 19-21% Mn, 1-3% Si, \$102.50; 16-19% Mn, \$100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; \$245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Shefield, Ala.; Portland, Oreg. Add or subtract \$2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump \$253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.05% C, and 6.5c for max 5.5% C—max 7% Si. Special Grade: (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, fo.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

#### TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot \$1.35, less ton \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract \$200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract \$225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

#### CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk. C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c.

37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.
Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025 max, 39.75c; 0.65% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.50c; 0.00; add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%. Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot add 0.25c

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

#### VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, \$3.20 per 1b of contained V. Delivered. Spot, add 10c. Special Grade: (V 50-55% or 70-75%, Si 2% max, C 0.5% max) \$3.30. High Speed Grade: (V 50-55%, or 70-75%, Si 1.50% max, C. 0.20% max) \$3.40. Grainal: Vanadium Grainal No. 1 \$1.05 per 1b; No. 79, 50c, freight allowed.

#### SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices. 65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c, per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.1. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c, for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

#### ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contact, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

#### BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy; less than 100 lb \$1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or  $3'' \times D$ , \$5.25 per lb of contained B. Packed, carload \$5.40, ton to c.l. \$5.50, less ton \$5.60. Delivered.

Bortam: (B 1.5-1.9%), Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotizanium.

#### CALICIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered, Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

#### BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3% lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered, Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered, Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., palets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si.) Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). \$1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

#### TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more \$2.15 per lb (nominal) of contained W. Delivered.

#### OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, \$4.25 per lb of contained Cb; less ton lots, \$4.30. Delivered.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, \$3.70 per lb of contained Cb plus Ta, delivered; less ton lot \$3.75.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unistage of \$4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., \$110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo., in 200-lb container, f.o.b. Langeloth and Washington, Pa. \$1.68 in all sizes except powdered which is \$1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, \$1.39; in bags, \$1.38, f.o.b. Langeloth and Washington, Pa.

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### Scrap Price Index Still Slipping

STEEL's composite on the prime grade declines another 17 cents, now standing at \$34.33. Slow demand and sluggish steelmaking operations are reflected

Scrap Prices, Page 158

Philadelphia—Except for No. 2 bundled scrap, prices are unchanged in a generally dull and heavy market. No. 2 bundles are off \$1 a ton to \$27, delivered. No. 1 heavy melting continues to hold at \$38.50.

Chicago—Scrap prices held steady last week, following the sharp drop of the previous week, but the market is listless. The only development of note: A large district steelmaker announced its price for No. 1 heavy melting steel of industrial origin will be \$33 a gross ton for April delivery. That's \$1 higher than another large mill has been offering and paying.

New York—The local market is easy, but prices are unchanged except for low phos structurals and plates which are nominally \$35-\$36

and No. 2 bundles, \$25-\$26.

Pittsburgh—A mill on the fringe of the Pittsburgh district made a small purchase of No. 1 heavy melting at \$34 last week. Prices dropped \$1 to \$6 in a general weakening of the market.

Cleveland — With district steelmaking operations bouncing around the 32 per cent of capacity mark, steelmakers are not showing much interest in scrap offerings. The market continues weak, and prices are nominal in the absence of representative sales.

Youngstown—The local market is still pointing downward. Mill and dealer yards are heavily stocked. Some consumers have indicated that if they buy this month it will be at lower prices than those now quoted.

The district ingot rate is estimated at 45 per cent. No. 1 heavy melting is quoted at \$35.

Cincinnati—Prices on the principal steelmaking grades moved down \$2 to \$3 a ton last week as area mills entered the market for their April requirements. Dealers' hesitancy in accepting low prices is fading.

Detroit — Scrap prices tumbled again. A lack of buyers caused dealers to be cautious in bidding on the auto lists. The slide in the market has finally affected the foundry grades which are quoted lower on the basis of a few scattered purchases of heavy breakable cast scrap.

Buffalo — Scrap price lists this month are expected to see a continuation of the sidewise movement. There is little prospect that quotations will advance soon, but market observers do not expect they will decline because of limited supplies in dealers' yards.

Houston — Prices on premium grades of scrap are off \$3 to \$5 a ton on the basis of a small purchase

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By Albert Portevin

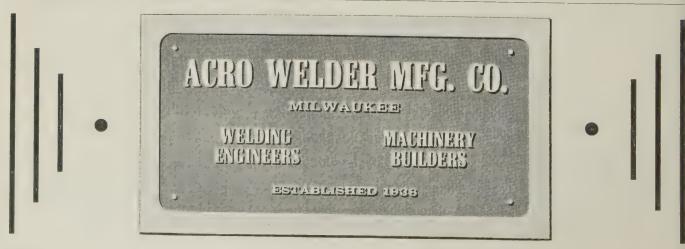
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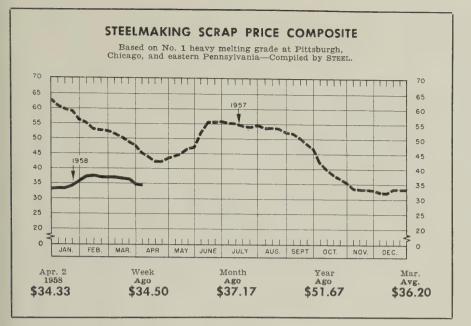
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for April delivery by the leading Texas steel mill. On the basis of its current operating rate, this steelmaker has more than a six month supply of scrap. It bought less than half its requirements for this month.

Except for sporadic buying at Eagle Pass, Tex., for a Mexican mill, no other support for the southwest market is expected this month. A second Texas steel mill may not buy during this quarter.

Birmingham — Prices are unchanged. But buying by domestic consumers is lacking, and quotations are untested, except for a dribble of orders for cast iron material. Open-hearth consumers and electric furnace operators are out of the market.

Seattle — Market conditions are unchanged here. Some dealers note a slightly easier situation, but sales on which to base firm prices are lacking. Yard receipts are lagging, and the larger buyers hold comfortable inventories.

Occasional lots are being sold for export, but indications are there will be little buying on Japanese account for several months.

The City of Seattle took bids Apr. 3 on about 100 tons of scrap rails.

Los Angeles—The local scrap market continues in the doldrums. No signs of an early improvement are seen. Mills are operating at a low rate, and they are buying little scrap. Prices are soft, but posted figures are unchanged. They are of little significance in the absence of representative purchases.

#### Structural Shapes . . .

Structural Shape Prices, Page 146

Public construction and highway work figure prominently in the structural market. The opening up of spring building programs is accounting for a little pickup, but demand is sluggish, and competition for new work is keen among fabricators as their backlogs shrink.

More bridge tonnage is being estimated. In New England, 10,000 tons, largely Connecticut projects, are involved. Contracts include 2000 tons for an office building addition in Boston.

New York and eastern Pennsylvania fabricators are taking more contracts in the northeast. Lower cost is placing most northern New England tonnage with the South Portland, Maine, shop.

Missile launching platforms and assembly buildings account for heavier inquiry at Nike sites. Watertown Arsenal will fabricate a substantial tonnage. It has a \$900,000 contract for launching structures.

Highway work to be let in Indiana this month amounts to 55 per cent of 1957 total volume. Illinois also has plans for increasing its highway program. The projects won't be speedily translated into steel inquiry because engineering work will take considerable time.

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Niagara District Engineers in Principal Cities of U.S. and Canada

ron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to

Iron and Steel Scrap	Steel, Apr. 2, 1958. Changes sh	own in italics.	•
STEELMAKING SCRAP	CLEVELAND	PHILADELPHIA No. 1 heavy melting 38.50	BOSTON (Brokers' buying prices; f.o.b.
Apr. 2 \$34.33 Mar. 26 34.50 Mar. Avg. 36.20 Apr. 1957 43.57 Apr. 1953 42.88	No. 1 heavy melting       30.00-31.00         No. 2 heavy melting       20.00-21.00         No. 1 factory bundles       32.00-33.00         No. 1 bundles       30.00-31.00         No. 2 bundles       21.00-22.00         No. 1 busheling       30.00-31.00         Machine ship turnings       8.00-9.00         Short shovel turnings       12.00-13.00         Mixed borings, turnings       12.00-13.00	No. 2 heavy melting       35.00         No. 1 bundles       38.50         No. 2 bundles       \$27.00         No. 1 busheling       38.50         Electric furnace bundles       40.00         Mixed borings, turnings       18.50†         Short shovel turnings       21.00†         Machine shop turnings       18.50†         Heavy turnings       34.00†	Shipping point
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.	Cast iron borings 12.00-13.00 Cut foundry steel 36.00-37.00 Cut structurals, plates 2 ft and under 39.00-40.00 Low phos, punchings	Structurals & plate 43.00-44.00 Couplers, springs, wheels 46.00 Rail crops, 2 ft. & under 59.00-60.00 Cast Iron Grades	No. 1 cast 29.00-30.00 Mixed cupola cast 28.00-29.00 No. 1 machinery cast 35.00-36.00 †Nominal
PITTSBURGH	plate	No. 1 cupola	DETROIT
No. 1 heavy melting. 33.00-34.00 No. 2 heavy melting. 29.00-30.00 No. 1 dealer bundles 33.00-34.00 No. 2 bundles 26.00-27.00	Afloy free, short shovel turnings 17.00-18.00 Electric furnace bundles 31.00-32.00 Cast Iron Grades	Malleable 62.00 Drop broken machinery 50.00 †Nominal.	(Brokers' buying prices; f.o.b. shipping point)  No. 1 heavy melting 25.00-26.00
No. 1 busheling 33.00-34.00 No. 1 factory bundles 36.00-37.00 Machine shop turnings 16.00-17.00 Mixed borings, turnings 19.00-17.00 Short shovel turnings 19.00-20.00 Cast iron borings 16.00-17.00 Cut structurals: 2 ft and under 39.00-40.00	No. 1 cupola       43.00-44.00         Charging box cast       34.00-35.00         Heavy breakable cast       34.00-35.00         Stove plate       43.00-44.00         Unstripped motor blocks       26.00-27.00         Brake shoes       34.00-35.00         Clean auto cast       43.00-44.00         Burnt cast       31.00-32.00	NEW YORK  (Brokers' buying prices)  No. 1 heavy melting 33.00-34.00  No. 2 heavy melting 29.00-30.00  No. 1 bundles 33.00-34.00  No. 2 bundles 25.00-26.00+  Machine shop turnings. 11.00-12.00+  Mixed borings, turnings 12.00-13.00+	No. 2 heavy melting 19.00-20.00 No. 1 bundles 26.00-27.00 No. 2 bundles 14.00-15.00 No. 1 busheling 25.00-26.00 Machine shop turnings 6.00-7.00 Mixed borings, turnings 8.00-9.00 Punchings & plate 29.00-30.00
3 ft lengths 38.00-39.00 Heavy turnings 28.00-29.00 Punchings 3 plate scrap 38.00-39.00 Electric furnace bundles 38.00-39.00	Drop broken machinery 48.00-49.00 Railroad Scrap	Short shovel turnings. 14.00-15.00† Low phos. (structurals & plates	Cast Iron Grades  No. 1 cupola
Cast Iron Grades  No. 1 cupola 40.00-41.00 Stove plate 40.00-41.00 Unstripped motor blocks 26.00-27.00	R.R. malleable 60.00-61.00 Rails, 2 ft and under 57.00-58.00 Rails, 18 in. and under 58.00-59.00 Rails, random lengths 50.00-51.00 Cast steel 47.00-48.00 Railroad specialties 49.00-50.00	No. 1 cupola 35.00-36.00 Unstripped motor blocks 28.00-29.00 Heavy breakable 34.00-35.00 Stainless Steel	Charging box cast 22.00-23.00 Heavy breakable 24.00-25.00 Unstripped motor blocks 14.00-15.00 Clean auto cast 31.00-32.00 SEATTLE
Clean auto cast	Uncut tires	solids	No. 1 heavy melting       30.00         No. 2 heavy melting       28.00         No. 1 bundles       24.00         No. 2 bundles       23.00         Machine shop turnings.       16.00
Rails, 2 ft and under . 54.00-55.00 Rails, 18 in. and under . 54.00-55.00 Angles, splice bars . 48.00-49.00 Rails, rerolling 58.00-59.00	(Brokers' buying prices; f.o.b. shipping point) 18-8 bundles, solids160.00-165.00 18-8 turnings 90.00-95.00	†Nominal. <b>BUFFALO</b> No. 1 heavy melting 28.00-29.00  No. 2 heavy melting 25.00-26.00	Mixed borings, turnings 16.00 Electric furnace No. 1. 38.00  Cast Iron Grades
Stainless Steel Scrap  18-8 bundles & solids. 175.00-180.00  18-8 turnings .ff . 80.00-85.00  430 bundles & solids .110.00-115.00  430 turnings . 50.00-52.00	430 clips, bundles, solids	No. 1 bundles       28.00-29.00         No. 2 bundles       23.00-24.00         No. 1 busheling       28.00-29.00         Mixed borings, turnings       14.00-15.00         Machine shop turnings       12.00-13.00         Short shovel turnings       15.00-16.00	No. 1 cupola         31.00           Heavy breakable cast.         28.00           Unstripped motor blocks         23.00           Stove plate (f.o.b. plant)         21.00
CHICAGO	(Brokers' buying prices) No. 1 heavy melting. 33.00	Cast iron borings 14.00-15.00 Low phos. structurals and	LOS ANGELES No. 1 heavy melting 32.00
No. 1 heavy melt., indus. 31.00-33.00 No. 1 hyy melt., dealer 29.00-30.00 No. 2 heavy melting 27.00-28.00 No. 1 factory bundles 34.00-35.00 No. 1 dealer bundles 31.00-32.00	No. 2 heavy melting       30.00         No. 1 bundles       33.00         No. 2 bundles       25.00         No. 1 busheling       33.00         Machine shop turnings       18.00         Short shovel turnings       20.00	plate, 5 ft and under 33.00-34.00 2 ft and under 37.00-38.00 Cast Iron Grades (F.o.b. shipping point) No. 1 cupola 43.00-44.00 No. 1 machinery 48.00-49.00	No. 2 heavy melting.       30.00         No. 1 bundles       28.00         No. 2 bundles       20.00         Machine shop turnings       9.00         Shoveling turnings       11.00         Cast iron borings       10.00
No. 2 bundles	Cast Iron Grades	Railroad Scrap Rails, random lengths. 47.00-48.00	Cut structurals and plate 1 ft and under 43.00
Machine shop turnings 17.00-18.00 Mixed borings, turnings 19.00-20.00 Short shovel turnings. 19.00-20.00 Cast iron borings 19.00-20.00 Cut structurals, 3 ft 41.00-42.00 Punchings & plate sorry 42.00-42.00	Charging box cast 33.00	Rails, 3 ft and under. 53.00-54.00 Railroad specialties 37.00-38.00 CINCINNATI	Cast Iron Grades (F.o.b. shipping point) No. 1 cupola 38.00
2.00-45.00	Stove plate 40.00	(Brokers' buying prices; f.o.b. shipping point)  No. 1 heavy melting 29.50-30.50	Railroad Scrap  No. 1 R.R. heavy melt. 32.00
Cast Iron Grades  No. 1 cupola	Railroad Scrap  No. 1 R.R. heavy melt. 38.00 Rails, 18 in. and under 56.00 Rails, random lengths 50.00	No. 2 heavy melting       26.50-27.50         No. 1 bundles       29.50-30.50         No. 2 bundles       19.00-20.00         No. 1 busheling       29.50-30.00         Machine shop turnings       12.00-13.00	SAN FRANCISCO         No. 1 heavy melting       32.00         No. 2 heavy melting       30.00         No. 1 bundles       30.00
Clean auto cast 48.00-49.00 Drop broken machinery 48.00-49.00 Railroad Scrap	Rails, rerolling 56.00 Angles, splice bars 49.00  BIRMINGHAM	Machine shop turnings. 12.00-13.00 Mixed borings, turnings. 11.00-12.00 Short showel turnings. 16.00-17.00 Cast iron borings. 11.00-12.00 Low phos. 18 in. 36.00-37.00	No. 2 bundles         22.00           Machine shop turnings         15.00           Mixed borings, turnings         15.00           Cast iron borings         15.00
No. 1 R.R. heavy melt. 34.00-35.00 R. R. malleable 53.00-54.00	No. 1 heavy melting 33.00-34.00 No. 2 heavy melting 29.00-30.00	Cast Iron Grades  No. 1 cupola 38.00-39.00	Heavy turnings 15.00 Short shovel turnings . 15.00 Cut structurals, 3 ft 40.00
Rails, 2 ft and under       54.00-55.00         Rails, 18 in. and under       55.00-56.00         Angles, splice bars       51.00-52.00         Axles       56.00-57.00         Rails, rerolling       54.00-55.00	No. 1 bundles	Heavy breakable cast 32.00-33.00 Charging box cast 32.00-33.00 Drop broken machinery 46.00-47.00 Railroad Scrap No. I R.R. heavy melt, 34.00-35.00	Cast Iron Grades  No. 1 cupola
Stainless Steel Scrap       18-8 bundles & solids     .165.00-170.00       18-8 turnings     .85.00-95.00       430 bundles & solids     .90.00-100.00       430 turnings     .47.50-52.50	Bar crops and plates 39.00-40.00 Structurals & plates	Rails, 18 in. and under 54.00-55.00 Rails, random lengths. 44.00-45.00 HOUSTON (Brokers' buying prices; f.o.b. cars) No. 1 heavy melting 32.00	Unstripped motor blocks 31.00 Clean auto cast 40.00 Drop broken machinery No. 1 wheels 34.00 HAMILTON, ONT.
No. 1 heavy melting     33.00-34.00       No. 2 heavy melting     23.00-24.00       No. 1 bushcling     33.00-34.00       No. 1 bundles     33.00-34.00       No. 2 bundles     23.00-24.00       Machine shop turnings     10.00-11.00       Short shovel turnings     14.00-15.00	Cast Iron Grades  No. 1 cupola	No. 2 heavy melting 30.00 No. 2 bundles 22.00* Crushed turnings 19.00 Machine shop turnings 15.00-16.00 Low phos. plates 37.00 Cast Iron Grades No. 1 cupola 38.00-39.00	No. 1 heavy melting       32.00         No. 2 heavy melting       28.00         No. 1 bundles       32.00         No. 2 bundles       25.00         Mixed steel scrap       27.00         Mixed borings, turnings       17.00         Busheling, new factory:       Prepared         32.00       32.00
Cast iron borings	Railroad Scrap  No. 1 R.R. heavy melt. 36,00-37.00 Rails, 18 in. and under 49.00-50.00 Rails, rerolling 52.00-53.00	Heavy breakable 30.00-31.00* Unstripped motor blocks 30.00-32.00* Railroad Scrap	Unprepared 26.00 Short steel turnings 21.00 Cast Iron Grades†
Railroad Scrap  No. 1 R. R. heavy melt. 40.00-41.00	Rails, random lengths 45.00-46.00 Angles, splice bars 43.00-44.00	No. 1 R.R. heavy melt. 34.00 *Nominal	No. 1 machinery cast. 45.00-50.00 †F.o.b. Hamilton, Ont.

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## Aluminum Price Cut to 24¢

First reduction in 16 years is precipitated by drop in Canadian quotation. Demand expected to remain as is. Lead producers chop their price 1 cent

Nonferrous Metal Prices, Pages 162 & 163

ALUMINUM, the glamour metal of the nonferrous family, has found it's not immune to the price fluctuations that have plagued its older cousins.

In a move that stunned the non-ferrous industry, on Apr. 1 primary producers dropped the price of pig 2 cents—to 24 cents a pound. It marks the first time in 16 years the pig quotation has been cut.

Timetable—The first salvo was fired on Mar. 27 when Aluminium Ltd.'s prexy, Nathanael V. Davis, announced that effective Apr. 1 his company was trimming the price of pig 2 cents a pound on a world-wide basis. (Last year, Aluminium shipped 227,800 tons of pig to the U. S., its biggest customer. See chart.)

The next day, Aluminum Co. of America revealed it would follow suit to meet competition. Within hours, Reynolds Metals Co. and Kaiser Aluminum & Chemical Corp. made similar announcements. They were later joined by Anaconda Co.

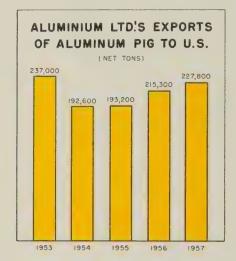
Why?—In explaining his move, Mr. Davis said: "Aluminum is now in free supply, and new capacity is scheduled to come into production in many areas. It is our conviction that this action will make aluminum more competitive with other materials, encouraging engineers and manufacturers to design their products for more of it and thus open up new applications for our product."

In nonferrous circles, it's believed that an important factor behind Aluminium's decision was the desire to meet Russian competition in the United Kingdom. Reliable sources say Russia sold 50,000 tons of pig in the UK last year at the expense of Aluminium.

Help?—One American producer says the new price will make aluminum more competitive with copper in the electrical conductor market

and in such auto applications as battery cables, housings, and fittings. (Primary copper now sells for 25 cents a pound.) The same producer says aluminum could also get a larger share of the diecasting market from zinc.

But most aluminum people seem



to be anything but happy. One spokesman points up this hypothetical case based on the new price, vs. the old: "If a company sold 500,000 tons of pig during the rest of 1958 at the 24-cent figure, it would lose \$20 million in sales revenue. The company would have to sell an additional 42,000 tons of pig to take in what it would at the 26-cent level. In today's market, this would

call for a real sales job." Consensus: It's doubtful the lower price will stimulate demand enough to make up for the loss in revenue.

More Costs — Besides being troubled by inflation, U. S. producers are faced with a labor contract that calls for a healthy wage boost on Aug. 1. Major terms: A 14 cent an hour raise per worker, plus cost of living adjustments.

Mill product quotations are being adjusted this week to correspond with the lower pig price.

#### Lead Price Gets the Ax

Oversupply left its mark on the lead industry last week as producers dropped their price from 13 to 12 cents a pound, New York (Apr. 1). This is the lowest quotation for lead since 1945. At 12 cents, producers feel they may beat foreign competition in the Midwest, but it will have little effect on the eastern seaboard.

Immediately following that announcement, one spokesman said he did not feel that the zinc price was in immediate jeopardy. "We're on the floor now. Any further reduction would probably be only a move to improve the chances of getting better tariff treatment."

#### Zinc Stockpiling Halts

The Office of Defense Mobilization says that deliveries of zinc to the national stockpile will end Apr. 15. However, lead will still be called for, probably until June. The zinc goal has been reached, according to Gordon Gray, ODM director.

#### NONFERROUS PRICE RECORD

	Price Apr. 2		Las Char		Previous Price	Mar. Avg	Feb. Avg	Apr., 1957 Avg
Aluminum .	24.00	Apr.	1,	1958	26.00	26.000	26.000	25.000
Copper	24.00-25.00	Mar.	24,	1958	23.30-25.00	24.163	24.298	31.598
Lead	11.80	Apr.	1,	1958	12.80	12.800	12.800	15.800
Magnesium .	35.25	Aug.	13,	1956	33.75	35.250	35.250	35,250
Nickel	74.00	Dec.	6,	1956	64.50	74.000	74.000	74,000
Tin	92.375	Apr.	2,	1958	92.50	93.425	93.818	99.276
Zinc	10.00	July	1,	1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

### BRIDGEPORT BRASS COPPER ALLOY BULLETIN



Bridgeport Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

#### Cored Forgings for Better, More Intricate Parts at Lower Costs

Compared with casting or solid forging, Bridgeport cored forgings save up to 50% in materials . . . cut machining and finishing time...reduce tool costs...eliminate rejects.

Cored forgings can be held to fine tolerances with accuracies of 0.005". They have great strength, high density, uniform grain structure, no porosity, and an extremely fine-textured hardware finish. High strength parts can be forged closer to finished forms than by other methods.

Send a sample part or assembly, together with full specifications, to the National Cored Forgings Division of Bridgeport Brass. Cost estimates will be supplied.



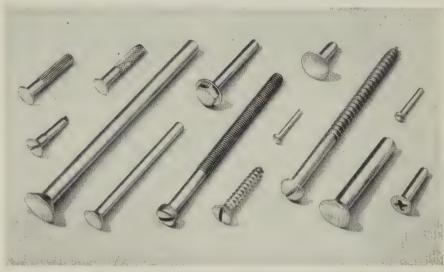
Typical cored-forged parts

#### **Metal Laminates Solve Design, Production Problems**

Bridgeport Metal Laminates provide combinations of chemical, physical and mechanical properties unobtainable in a single metal. Use them to solve dual corrosion problems, improve electrical and thermal conductivity, combine high thermal conductivity with corrosion resistance, and provide greater strength-to-weight

Write for test samples and for a copy of the 8-page booklet detailing applications, properties, types, sizes, etc., of Bridgeport Metal Laminates.

#### Stock Temper Bridgeport Wire Meets Many Special Cold Heading Needs



A few of the wide range of Rockford Screw Products fasteners made with Bridgeport wire,

Bridgeport's high-quality standard alloys help produce superior products and cut costs too. For example, Rockford Screw Products, Rockford, Ill., finds it possible to use our stock temper wire for a wide range of special and standard fasteners. Gains in economy are obvious. To conserve material and reduce manufacturing costs, the company cold heads the parts. Bridgeport Brass and Copper Alloy wires have the high qualities of malleability, ductility, strength and stiffness for this process.

#### **Alloys Used**

Three Bridgeport Alloys are used by Rockford Screw Products:

70-30 Brass 69: an extremely ductile wire, particularly suitable for making exceptionally large heads and certain types of hollow rivets.

Silicon Bronze 609: an outstandingly malleable alloy even in hard-drawn condition. Finished bolts above 100,000 lb per square inch can be produced from it. This alloy is highly resistant to stresscorrosion cracking and is suitable for outdoor construction where brass and steel may not be satisfactory.

Commercial Bronze 25: although named "commercial bronze," this alloy does not contain tin. It resists seasoncracking and is more resistant to dezincification than brass. It is recommended for interior or exterior applications.

#### **Bridgeport's Wide Range of Alloys**

Rockford Screw Products has found that corrosion resistance, lasting strength and hardness, and ease of finishing make Bridgeport Brass and Copper Alloys ideal for all types of industrial fasteners. And the great variety of alloys available assures the selection of a metal with exactly the right characteristics for any particular job.

Whatever the application and whatever the industry, Bridgeport Alloys help improve products, smooth production, cut costs. Your Bridgeport Salesman will be happy to advise you-and through him is available the full experience and facilities of Bridgeport's Technical Service. Call him.



#### BRIDGEPORT BRASS

Bridgeport Brass Company, Bridgeport 2, Conn. • Sales Offices in Principal Cities In Canada: Noranda Copper and Brass Limited, Montreal

#### Nonferrous Metals

Cents per pound, carlots except as otherwise

#### PRIMARY METALS AND ALLOYS

13, 29.90; No. 43, 29.70 Aluminum Aliov: No. No. 195, 31. 30-lb ingots. 31.30; No. 241, 31.50; No. 356, 29.90,

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Antimony: R.M.M. Grand, 99.5%, 29.50; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, \$74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, \$43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping

Bismuth: \$2.25 per ton, ton lots.

Cadmium: Sticks and bars, \$1.55 per lb deld. Cobalt: 97-99%, \$2.00 per lb for 550-lb keg; \$2.02 per lb for 100 lb case; \$2.07 per lb under 100 lb.

Columbium: Powder, \$55-90 per 1b, nom. Copper: Electrolyic, 25.00 deld.; custon smelters, 24.00; lake, 25.00 deld.; fire refined, 24.75 deld. custom

Germanium: First reduction, \$179.17-197.31 per lb; intrinsic grade, \$197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, \$35 per oz.

Indium: 99.9%, \$2.25 per troy oz.

Iridium: \$70-90 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add

Lithium: 98 + %, 50-100 lb, cups or ingots, \$12; rod, \$15; shot or wire, \$16. 100-500 lb, cups or ingots, \$10.50; rod, \$14; shot or wire, \$15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.7 deld.; AZ63A, AZ92A, AZ91C (sand casting) 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, \$232 237 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, \$9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 779.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colorne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont. freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: \$70-100 per troy oz nom.

Palladium: \$19-21 per troy oz.

Platinum: \$68-75 per troy oz from refineries. Radium; \$16-21.50 per mg radium content, depending on quantity.

Rhodium: \$118-125 per troy oz.

Ruthenium: \$45-55 per troy oz.

Selenium: \$7.00 per lb, commercial grade. Silver: Open market, 88.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, \$60 per lb; sheet, \$55 per lb.

Tellurium: \$1.65-1.85 per lb.

Thallium: \$7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.375.

Tungsten: Powder, 98.8%, carbon reduced. 1000-1b lots, \$3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00, 99+% hydrogen reduced, \$3.85.

Nythogen Petacec, 98.50.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, \$5-10

(Note: Chromium, manganese, and silicon met-als are listed in ferroalloy section.)

#### SECONDARY METALS AND

Aluminum Ingot: Piston alloys, 23.00-24.00; No. 12 foundry alloy (No. 2 grade), 21.00-21.50; 5% silicon alloy, 0.60 Cu max., 24.25-25.00; 13 alloy, 0.60 Cu max., 24.25-25.00; 195 alloy, 24.00-25.50; 108 alloy, 21.50-21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00; grade 2, 21.25; grade 3, 20.00; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 25.25; tim bronze, No. 225 34,00, No. 245, 28,75; high-leaded tim bronze, No. 305, 29.25, No. 1 yellow, No. 405, 20.75; manganese bronze, No. 421, 23.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

#### NONFERROUS PRODUCTS

#### RERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, \$1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod. bar, wire, \$1.78, f.o.b. Temple, Pa.

#### COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33,28. Magnet wire deld., 38.43, before quantity discounts.

#### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, \$18.50 per cwt; pipe, full coils, \$18.50 per cwt; traps and bends, list prices plus 30%.

#### TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, \$9.50-15.95; sheared mill plate, \$8.00-11.50; wire, \$7.50-11.50; forging billets, \$6.00-7.60; hot-rolled and forged bars, \$6.15-7.90.

(Prices per lb, c.l., f.o.b. mill.) Sheets, \$24.00; plate, \$12.50-19.20; H.R. strip, \$12.50-22.90; \$11.00-17.40.

#### ZIRCONIUM

C.R. strip, \$15.00-31.25; forged or H.R. bars, ribbon zinc in coils, 20.50; plates, 19.00.

#### NICKEL, MONEL, INCONEL

- A,	MICKEL	wioner	Ancone
Sheets, C.R	126	106	128
Strips, C.R	124	108	138
Plate, H.R	120	105	121
Rod, Shapes, H.R	107	89	109
Seamless Tubes	157	129	200

#### ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed). Thickness  $\dot{}$ 

Range	Flat	Coiled
Inches	Sheet	Sheet
0.249-0.136	43.10-47.60	
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.009%	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

#### ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths. Plate Base Circle Base Alloy 47.50 1100-F, 3003-F ... 42.70 5050-F .... 43.80 44.80 5052-F 6061-T6 2024-T4 7075-T6\* 51.20 53.00 46.90 50.60

\*24-48 in. width or diam., 72-180 in. lengths.

58.40

Screw Machine Stock: 30,000 lb base. Diam. (in.) or —Round— —Hexagonal—across flats 2011-T3 2017-T4 2011-T3 2017-T4

DIWWII				
0.125	78.20	75.20		
0.156-0.172	66.20	63.40		
0.188	66.20	63.40		81.60
0.219-0.234	63.00	61.50		
0.250-0.281	63.00	61.50		77.90
0.313	63.00	61.50		74.20
0.344	62.50			
Cold-Finished				
0.375-0.547	62,50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59 70		59.60

	0.003-0.000	04.00	01.00	11.10	00.00
	0.719-1.000	61.00	59.70	64.90	61.70
	1.063	61.00	59.70		59.60
	1.125-1.500	58.60	57.40	62.80	59.60
2	olled				
	1.563	57.00	55.70		
	1.625-2.000	56.30	54.90		57.50
	2.125-2.500	54.80	53.40		
	2.563-3.375	53.20	51.70		

Forging Stock: Round, Class 1, railengths: 2014-F, 46.90-53.90, diam. 1-8 6061-F, 43.50-53.90, diam. 1-6 in; 70 63.50-73.90, diam. 1-3.875 in.; 7079-F, 6 7075-F 63.50-73.90, diam. 1-3.78.90, diam. 1-3.875 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
3/4	\$19.40	2	\$ 59.90
1	30.50	4	165.05
11/4	41.30	6	296.10
1 1/2	49.40	8	445.55

#### Extruded Solid Shapes:

		Alloy		Alloy
Factor		6063-T5		6062-T6
9-11		45.40-47.00		60.60-64.86
12-14		45.70-47.20		61.30-65.80
width:	.125	in., 74.90; .188	in.,	71.70-72.70;
18-20		46.50-48.30		64.50-70.10

#### MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

#### Evitanded Solid Shapes:

Extraded 50.	iiu Shapes.	
	Com. Grade	Spec. Grade
Factor	(AZ31C)	(AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90 60-91.30
36-38	89.20-90.30	104.20-105.30

#### NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

**Aluminum:** 1100 clippings, 13.00-13.50; old sheets, 10.00-10.50; borings and turnings, 6.50-

#### **BRASS MILL PRICES**

		MILL PRO	DUCTS a		SCRAP ALLOWANCES f
	Sheet.				
	Strip,			Seamless	Clean Rod Clean
	Plate	Rod	Wire	Tubes	Heavy Ends Turnings
Copper	48.13b	45.36c		48.32	21.000 21.000 20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125 15.875 14.500
	44.90	44.84	45.44	47.71	17.875 17.625 17.125
	45.67	45.61	46.21	48.48	18.625 18.375 17.875
	46.98	46.92	47.52	49.54	19.250 19.000 18.500
Manganese Bronze	50.81	44.91	55.44		14.875 14.625 14.125
Muntz Metal	45.19	41.00			15.125 14.875 14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875 14.625 14.125
Silicon Bronze		52.03	52.88	54.77	20.625 20.375 19.625
Nickel Silver, 10%		60.26	60.26		21.125 20.875 10.562
Phos. Bronze, A-5%		67.67	67.67	68.85	21.875 21.625 20.625
a. Cents per lb, f.o.b.	mill; freig	ht allowed	on 500 lb c	r more. I	o. Hot-rolled. c. Cold-drawn.
d. Free cutting. e. Prices	in cents	per lb for	less than 20	,000 lb, f	.o.b. shipping point. On lots

over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcase, e, 10.00-10.50; industrial cast-

Copper and Brass: No. 1 heavy copper and wire, 17.50-18.00; No. 2 heavy copper and wire, 15.50-16.00; light copper, 13.50-14.00; No. 1 composition red brass, 14.50-15.00; No. 1 composition turnings, 13.50-14.00; new brass clippings, 13.00-13.50; light brass, 8.00-8.50; neavy yellow brass, 10.00-10.50; new brass rod mids, 11.00-11.50; auto radiators, unsweated, 11.00-11.50; cocks and faucets, 12.00-12.50; prass pipe, 12.00-12.50.

Lead: Heavy, 8.50-9.00; battery plates, 3.50-8.75; linotype and stereotype, 9.75-10.25; electrotype, 9.00-9.50; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rodends, 42.00-45.00.

Zine: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

#### REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 15.50-16.25; 3003 clippings, 15.50-16.25; 6151 clippings, 15.50-16.50; 6151 clippings, 15.50-16.50; 5052 clippings, 15.00-15.75; 2014 clippings, 15.00-15.25; 2017 clippings, 15.00-15.25; 2024 clippings, 15.00-15.25; mixed clippings, 14.00-14.75; old sheets, 11.50-12.25; old cast, 11.50-12.25; clean old cable (free of steel), 14.50-15.25; borings and turnings, 12.00-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire 18.25; light copper, 16.00; refinery brass (60% copper) per dry copper content, 17.50.

#### INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.25; light copper, 16.00; No. 1 composition borings, 17.25; No. 1 composition solids, 17.25; heavy yellow brass solids, 11.50; yellow brass turnings, 10.50; radiators, 14.00.

#### PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quanties)

#### ANODES

Cadmium: Special or patented shapes, \$1.70

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zine: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

#### CHEMICALS

Cadmium Oxide: \$1.70 per lb in 100-lb drums. Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 68.40; 300-900 lb, 66.40; 1000-19,900 lb, 64.40.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or nore, 40.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-300 lb, 65.80; 700-1900 lb, 63.00; 2000-9900 lb, 1.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 b, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 b, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or nore, 87.20.

itannous Sulphate: Less than 50 lb, 126.90; 50 b, 96.90; 100-1900 lb, 94.90; 2000 lb or more, b, 96 2.90.

inc Cyanide: 100-200 lb, 59.00; 300-900 lb,

#### STRUCTURAL SHAPES . . .

#### STRUCTURAL STEEL PLACED

1100 tons, general service building, Georgia Power Co., Atlanta, to the Calvert Iron Works Inc., Atlanta; Beers Construction Co., Atlanta, general contractor; 70 tons, reinforcing bars, to the Calvert Iron Works Inc.

1600 tons, operations building, Baptist Sunday School Board, Nashville, Tenn., to the In-galls Iron Works, Norristown, Pa.; W. F. Holt & Sons, Nashville, general contractor.

1440 tons, five state highway bridge structures, Saratoga County, New York, to the City Iron Works, Hartford, Conn.; Arute Bros. Inc., New Britain, Conn., general con-

450 tons, terminal building, state airport, Hillsgrove, R. I., to the Tower Iron Works, Providence, R. I.; Nanni Building Co., Johnston, R. I., general contractor; 75 tons, reinforcing bars, Plantations Steel Co., Providence.

350 tons, I-beam and concrete box girder bridge, Bangor, Maine, to the Bancroft & Martin Rolling Mills Co., South Portland, Maine; Westcott Construction Co., North Attleboro, Mass., general contractor.

345 tons, two I-beam bridges, Cumberland, Maine, to the Bancroft & Martin Rolling

Mills Co., South Portland, Maine; H. E. Callahan Inc., Auburn, Maine, is general contractor.

contractor.
300 tons, newspaper publishing plant, Herald-Traveler, Boston, to the Grand Iron Works.
New York; B. Perini & Sons Inc., Framing-ham, Mass., general contractor; 1500 tons. reinforcing bars, to the U. S. Steel Supply Div., U. S. Steel Corp., Boston.
150 tons, Blue Cross headquarters, Seattle, to the Pacific Car & Foundry Co., Seattle; John H. Sellen Construction Co., Seattle, general contractor.

#### STRUCTURAL STEEL PENDING

1000 tons, 531-ft interstate highway bridge. Vancouver, Wash.; General Construction Co., Portland, Oreg., low at \$2,993,995 to the Oregon Highway Commission.

900 tons, also piling, Oregon State bridge, Snake River; bids in at Portland, Oreg. 800 tons, Washington State highway bridges, Pierce, Chelan, and Adams counties; bids in Apr. 1.

500 tons, trashracks and equipment, Chandler project, Washington State; bids in to the Bureau of Reclamation, Denver.

117 tons, metal crossarms; bids in to the

Bonneville Power Administration, Portland,

(Please turn to Page 164)

#### CLASSIFIED ADVERTISING

OVERHEAD CRANE

1 SHAW BOX 15 Ton 100' Span
1 P & H 15 Ton 100' Span
1000' Runway A-Frame Mounted
25' Clearance
230 DC Volts, Photographs Available.
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EL. 2-4216

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Salesmen with specialty steel sales experience for the following available territories: Chicago and/or the State of Illinois; Toronto, Canada; Georgia; Tennessee; Vir-

Also, Manufacturers' Representatives with industrial following. Good commission, exclusive territory. Our men know of this ad. Write for full information.

Box 650, STEEL

Penton Bldg.

Cleveland 13, Ohio

#### ARE YOU REPRESENTED IN OHIO?

Graduate mechanical engineer with well established sales office in the Cleveland area would like to represent one additional account. Most interested in production items to be sold to O. E. M. firms. Will only consider well established company.

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GENERAL FOUNDRY FOREMAN
For mechanized ferrous foundry in Midwest.
Must be experienced in gating. Have knowledge
of Standard Costs. Supervise all molding operations. Submit confidential resume. Write Box
646, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXPERIENCED MISCELLANEOUS AND OR-NAMENTAL iron estimator or detailer to take complete charge of drafting department, includ-ing all purchasing and expediting. Please give complete resume of experience, age, and salary expected in first reply. Write Box 648, STEEL, Penton Bldg., Cleveland 13, Ohio.



#### FOR SALE

Wheelabrator cabinets for shot peening with work car will handle work 3' to 6'.

Wheelabrator cabinet for armor plates up to 30'.

Wheelabrator cabinet for pipes, tubes, strips, tanks.

Wheelabrator tumblast 36" x 42". Sandblasting tanks, cabinets, suction vapor vacuum blast, tensile testers, dust collectors. Priced to sell.

M. ELSTEIN 426 Grand Street Jersey City 2, N. J.



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Let STEEL's classified columns do the job for you. STEEL reaches all types of executives in the metalworking industry. Plan now to reach the highly-trained men you want by means of an advertisement in the "classifieds." For rates, write STEEL, Penton Building, Cleveland 13, Ohio.

To ease your needs for.

#### NEW CAPITAL EXPENDITURES



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Facility....

AVAILABLE - TO YOU

Simple arithmetic explains why, TODAY, many of America's leading manufacturers no longer undertake to solve the problems involved in making gears. For them, FAIRFIELD IS THE ANSWER!

Every facility is available at Fairfield—cost-cutting, ultra-modern equipment kept busy by volume production. This makes for economy and efficiency that can benefit YOU.

Check with Fairfield NOW on your gear production schedules. As one of the nation's largest independent producers, Fairfield can usually give you quickest service available and handle any production requirement. Become a Fairfield customer; it pays! CALL OR WRITE.

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TRACTORS . HEAVY DUTY TRUCKS . AGRICULTURAL MACHINERY . POWER SHOVELS AND CRANES MINING MACHINES . ROAD GRADERS . BUSES . STREET SWEEPERS . INDUSTRIAL LIFT TRUCKS

#### (Concluded from Page 163)

#### REINFORCING BARS . . .

#### REINFORCING BARS PLACED

2400 tons, operations building, Baptist Sunday School Board, Nashville, Tenn., to Wilson, Weesner & Williams Co.; W. F. Holt & Sons, Nashville, is general contractor.

2000 tons, 21-story office building and attached eight-story garage, Superior Ave., Ninth & Walnut Streets, Cleveland, Tishman Realty & Construction Co. Inc., to the Builders Structural Steel Corp., Cleveland.

785 tons, I-beam and concrete box girder bridge, Bangor, Maine, to the Bancroft & Martin Rolling Mills Co., South Portland, Maine; Westcott Construction Co., North Attleboro, Mass., general contractor; also 60 tons, H-beam pilings, Bethlehem Steel 60 tons, Co., Bethlehem, Pa. 600 tons, University Center Building, Tulane

University, New Orleans, to the Laclede Steel
Co., St. Louis; Farnsworth & Chambers Co.,
New Orleans, general contractor; 40 tons,
structurals, Delany Steel Co., New Orleans.
410 tons, five state highway bridge structures,

Saratoga County, New York, to the Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros. Inc., New Britain, Conn., is general contractor.

400 tons, University of Washington, engineering building, Seattle, to the Northwest Steel Rolling Mills Inc., Seattle; John H. Sellen Construction Co., Seattle, general contractor at \$932,075.

250 tons, state highway bridges, Tift-Turner counties, Georgia, to Joe Brashews Steel Inc., Albany, Ga.; H. M. Pafford Jr., Waycross. Ga., general contractor.

200 tons, four grade separation structures, Tift county, Georgia, to the Alabama Steel Co., Birmingham; W. L. Robinson Construction Co., College Park, Pa.; fabricated structural steel, American Bridge Div., U. S. Steel Corp., Pittsburgh.

two I-beam bridges, Cumberland-Yarmouth, Maine, to the Bancroft & Martin Rolling Mills Co., South Portland, Maine; H. E. Callahan Inc., Auburn, Maine, gen-eral contractor; 100 tons of H-beam piling, Bethlehem Steel Co., Bethlehem, Pa.

53 tons, Blue Cross headquarters, Seattle, to the Bethlehem Pacific Coast Steel Corp., Seattle; John H. Sellen Construction Co., Seattle, general contractor.

#### REINFORCING BARS PENDING

37,750 tons, work section No. 1 Niagara Falls, N. Y., Niagara contract N-5, St. Seaway; bids May 6, Power Authority of the State of New York, New York.

34,250 tons, work section No. 2, Niagara contract No. N-6, St. Lawrence Seaway; bids May 1, Power Authority of the State of New

York, New York.

22,500 tons, work section No. 3, Lewiston-Niagara, N. Y., Niagara contract N-7, St. Lawrence Seaway; bids May 20, Power Authority of the State of New York, New

720 tons, reinforced concrete highway, including 645 tons of welded mesh, Warwick-West Greenwich, R. I.

615 tons, railroad bridge and three grade separation structures, relocation, Route 34, New Haven, Conn.; bids Apr. 10, Hartford, Conn.; also 300 tons of H-piles.

415 tons, rebuilding interstate bridge, Van-couver, Wash.; General Construction Co., Portland, Oreg., low base bid of \$2,993,995 to the Oregon Highway Commission.

400 tons, Washington State highway projects, Lincoln, Adams, counties; bids in. Whatcom and Klickitat

400 tons, Oregon highway projects, bids in 300 tons, interstate bridge, Snake River; bids in to the Oregon Highway Commission. 250 tons, Bank of California, open deck park-

ing garage, Seattle; general contract to the General Construction Co., Seattle.

150 tons, ammunition magazines, Geiger Afr

Base, Washington State; H. Halvorson Inc., Yardley, Wash, low bidder at \$691,924.

100 tons, Washington State, highway project, Grays Harbor County; bids to Olympia, Wash., Apr. 15.

100 tons plus, two 245-ft underpasses and two overpasses, Power County, Idaho; bids to Boise, Idaho, Apr. 15.

#### **Advertising Index**

Abell-Howe Co
Acro Welder Mfg. Co
Aetna-Standard Engineering Co., The Inside Back Cover
Air Reduction Sales Co., A Division of Air
Reduction Co., Inc 24
Ajax Electric Co 77
Ajax Electric Motor Corporation         163           Allen-Bradley Co.         25, 26
Allis-Chalmers
Aluminium Limited Sales, Inc
American Brass Co., The
American Chemical Paint Co
American MonoRail Co
American Nickeloid Co. 87 American Steel & Wire Division, United States
Steel Corporation 11 34 35
American Welding & Manufacturing Co., The 54
Armco Steel Corporation
Aronson Machine Co
Bailey, William M., Co
Baldwin-Lima-Hamilton Corporation, Hamilton
Division 37 Bethlehem Steel Co. 1
Bethlehem Steel Co
Hoist, Ingersoll Products Division 136
Bridgeport Brass Co
Broderick & Bascom Rope Co
Carlson, G. O., Inc
Chambersburg Engineering Co 49
Chicago Steel Service Co 127
Cincinnati Grinders, Inc
Cincinnati Shaper Co., The
Columbia-Geneva Steel Division, United States
Steel Corporation
Conforming Matrix Corporation 155
Copper & Brass Research Association 70 Cutler-Hammer, Inc
Cutler-Hammer, Inc 85
Despatch Oven Co
Detroit Steel Corporation 58
Dexter Folder Co., Division of Miehle-Goss- Dexter, Inc
Diamond Mfg. Co
Dravo Corporation
Duraloy Co., The
Duraloy Co., The
buildy co., the
Eastman Kodak Co., X-ray Division
Eastman Kodak Co., X-ray Division 131 Elastic Stop Nut Corporation of America 7 Erie Forge & Steel Corporation 117 Esso Standard Oil Co. 100 Euclid Crane & Hoist Co., The 155  Fairbanks, Morse & Co. 36 Fairfield Manufacturing Co. 164 Enster L. B. Co. 163
Eastman Kodak Co., X-ray Division
Eastman Kodak Co., X-ray Division 131 Elastic Stop Nut Corporation of America 7 Erie Forge & Steel Corporation 117 Esso Standard Oil Co. 100 Euclid Crane & Hoist Co., The 155  Fairbanks, Morse & Co. 36 Fairfield Manufacturing Co. 164 Foster, L. B., Co. 163 Frasse, Peter A., & Co., Inc. 2
Eastman Kodak Co., X-ray Division

Kardong Brothers, Inc.	156
Landis Machine Co	33
Littleford Bros., Inc.	138
McGill Manufacturing Co., Inc.	44
Miehle-Goss-Dexter, Inc., Dexter Folder Co.	42
Moltrup Steel Products Co	153
Morse Chain Co	13
National Acme Co., The	. 19 39
National Tube Division, United States Steel	11
Corporation Niagara Blower Co.	157
Nicholson File Co.	22
Northern Engineering Works	165
Oakite Products, Inc.	141
Ohio Crankshaft Co., The	3
Olin Mathieson Chemical Corporation, Aluminum Division	144
Pannier Corporation, The	155
Pickands Mather & Co.	45
Pittsburgh Steel Co	41
Pollock, William B., Co., The	121
Reading Crane & Hoist Corporation	140
Republic Steel Corporation	21
	91
Subsidiary of The Colorado Fuel & Iron	
Roebling's, John A., Sons Corporation, A. Subsidiary of The Colorado Fuel & Iron Corporation	27 57
Simonda Com 9 M/ C TI	
Simonds Gear & Mfg. Co., The	89 92
Sterling Wheelbarrow Co.	81
Sun Oil Co., Industrial Products Department.	9
Sun Shipbuilding & Dry Dock Co	93
Tempil Corporation	140
Tennessee Coal & Iron Division, United States Steel Corporation	35
Thomas Machine Manufacturing Co	142
Timken Roller Regging Co. The Steel & Tube	52
Timken Roller Bearing Co., The, Steel & Tube Division Back Co. Torrington Manufacturing Co., The	over
Torrington Manufacturing Co., The Tubular Rivet & Stud Co	23
	12
Union Carbide Corporation, Haynes Stellite Division14,	15
United States Rubber Co., Mechanical Goods Division	109
United States Steel Corporation, Subsidiaries	35
United States Steel Export Co11, 34,	35
United States Steel Supply Division, United States Steel Corporation	11
Vanadius Cananita da da	99
Vanadium Corporation of America	4
Woles Stringle Co.	10
Wales Strippit Co	140
Wheelabrator Corporation	124
Whiting Corporation	88
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation	112
Wood, R. D., Co.	129
Yoder Co., The	6
Youngstown Sheet & Tube Co., The	8
$\sim$ $\sim$	
Table of Contents, Page 5	



# .... for cutting cost corners

The present necessity of cutting costs and increasing production requires the most effective use of tooling and equipment. Maintaining your competitive position may be resolved by your ability to cut every possible cost corner in your processing.

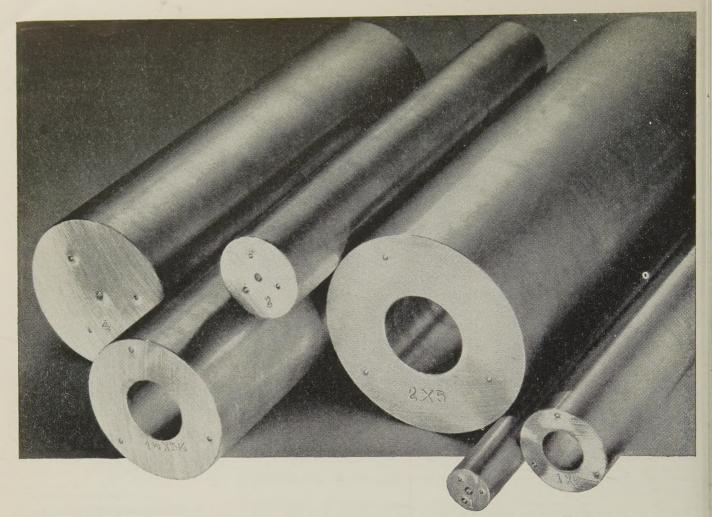
A NORTHERN CRANE—in capacities up to 150 tons, and of any desired span—provides safer, faster, more dependable heavy load handling than was adequate when production schedules were lower, or when the high cost of delays was not as critical as today. You can cut many cost corners with NORTHERN CRANES.

Bulletin SE-108-A (up to 150 tons) or, Bulletin HL-115-R (up to 20 tons) will be sent at your request.

#### NORTHERN ENGINEERING WORKS

210 CHENE ST., DETROIT 7, MICH.





# You get **Convenience** and **Quality** with Johnson Bronze Bars

For your convenience, Johnson Bronze solid and cored bars are now stamped on each end with the exact size. This makes it unnecessary to remove bars from bins to check the OD for size—helps prevent errors—makes for quick inventory. Also, bars of various sizes can be stored in one bin because the size is visible which saves storage space.

In addition, the ends of all Johnson bars are centered for ease and accuracy of machining. All the operator has to do is set the chuck on the indented marks, take a 1/64" cut and he has the size bar indicated. This speeds machining, assures concentric parts since the work is always in perfect alignment. Also, Johnson bars are in the convenient 13" length—are easy to store and handle.

The quality of Johnson bronze bars is rigidly controlled from heat to heat by frequent chemical analysis. These bars are produced in permanent molds or by centrifugal casting. Either method eliminates the possibility of sand inclusions—allowing maximum uniform density.

Johnson Bronze bars are available in over 400 stock sizes. They are used extensively for making bearings, washers, thrust plates, gears, pinions, guides, rollers, sheaves, trolley wheels and other parts for original equipment and maintenance. They are quickly available from your distributor. Ask him for a folder which lists the range of sizes of cored and solid bars or write Johnson Bronze Company, 550 S. Mill Street, New Castle, Pa.

### **Johnson Bearings**

Subsidiary: Apex Bronze Foundry Co., Oakland, Cal.





GRAPHITED over 175 sizes



GENERAL PURPOSE oyer 900 sizes



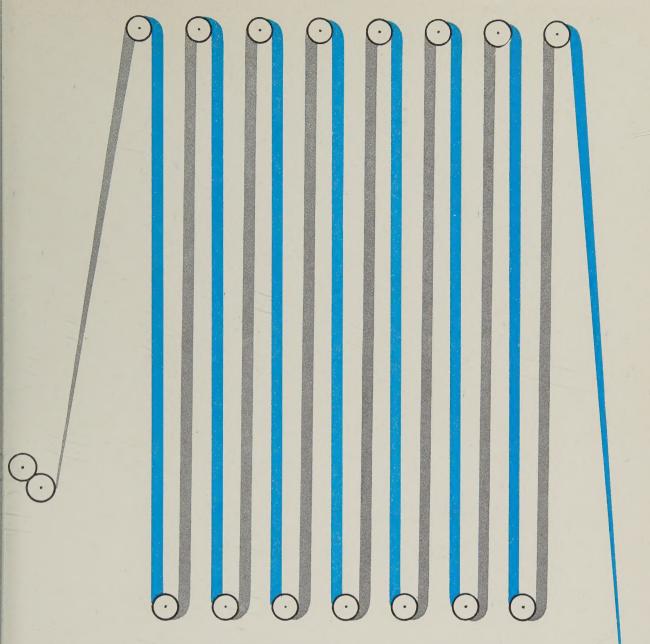
UNIVERSAL BRONZE BARS



LEDALOYL over 400 sizes



ELECTRIC MOTOR
over 350 sizes



### CONTINUOUS ANNEALING LINES

another specialty of Aetna-Standard

Like Continuous Galvanizing or Tinning, a Continuous Annealing Line requires good designing and rugged equipment.

Aetna has much experience in continuous processing lines, galvanizing, tinning and annealing. In fact, Aetna pioneered in continuous equip-

ment. Two of the most recent high speed Aetna lines incorporate many new ideas and innovations, permitting sure tracking at high speeds of 1,000 feet and more.

What can Continuous Annealing do for your production and your costs? Aetna's sales engineers can produce some interesting figures.

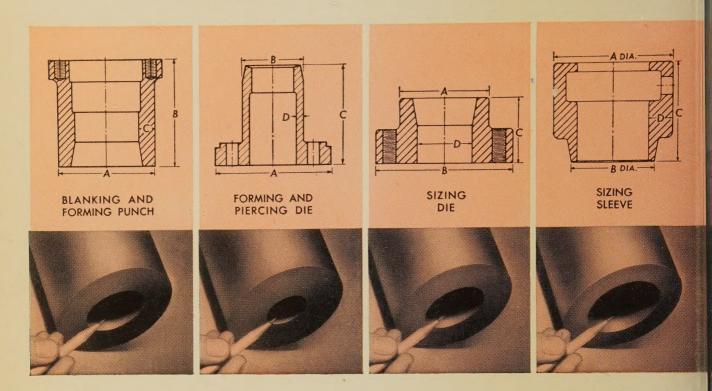
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ENERAL OFFICES: PITTSBURGH, PA. . PLANTS: ELLWOOD CITY, PA., WARREN, OHIO . RESEARCH LABORATORY: AKRON, OHIO

NTINUOUS GALVANIZING LINES . CONTINUOUS ANNEALING LINES . CONTINUOUS ELECTROLYTIC TINNING LINES . SIDE TRIMMING AND EAR LINES AND OTHER FINISHING EQUIPMENT . CONTINUOUS BUTT WELD PIPE MILLS . SEAMLESS TUBE MILLS . DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT . ROLLS AND CASTINGS . EXTRUDERS, MILLS, PRESSES FOR RUBBER, PLASTIC AND CHEMICAL

# Make ring-shaped tool steel parts like these faster, at less cost...



# Make 'em from Graph-Mo Hollow Bar® —the hole's already there

If you're looking for a faster, more economical way to make your ring-shaped tool steel parts—and get a better finished product—here's the answer. Use Graph-Mo Hollow Bar®. Because drilling is eliminated, you cut costs and speed production. And you get a tool steel that machines faster, wears longer, gives more stability.

Graph-Mo machines faster than ordinary tool steels because of the free graphite in its structure. And there's far less tendency to pick up, scuff or gall.

Users report that Graph-Mo outwears other tool steels by 3 to 1 on the average! This durability results from the combination of free graphite and diamond-

hard carbides in Graph-Mo's structure.

And there isn't a more stable tool steel than Graph-Mo Hollow Bar. For example: after 12 years of use, a master plug gauge machined from Graph-Mo showed less than 10 millionths of an inch dimensional change.

To make ring-shaped tool steel parts faster at less cost, specify Graph-Mo Hollow Bar. You'll have a better finished product. And you can choose Graph-Mo Hollow Bar from 3 to 16 inches in O.D. with many wall thicknesses. For more information write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

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